

330/345

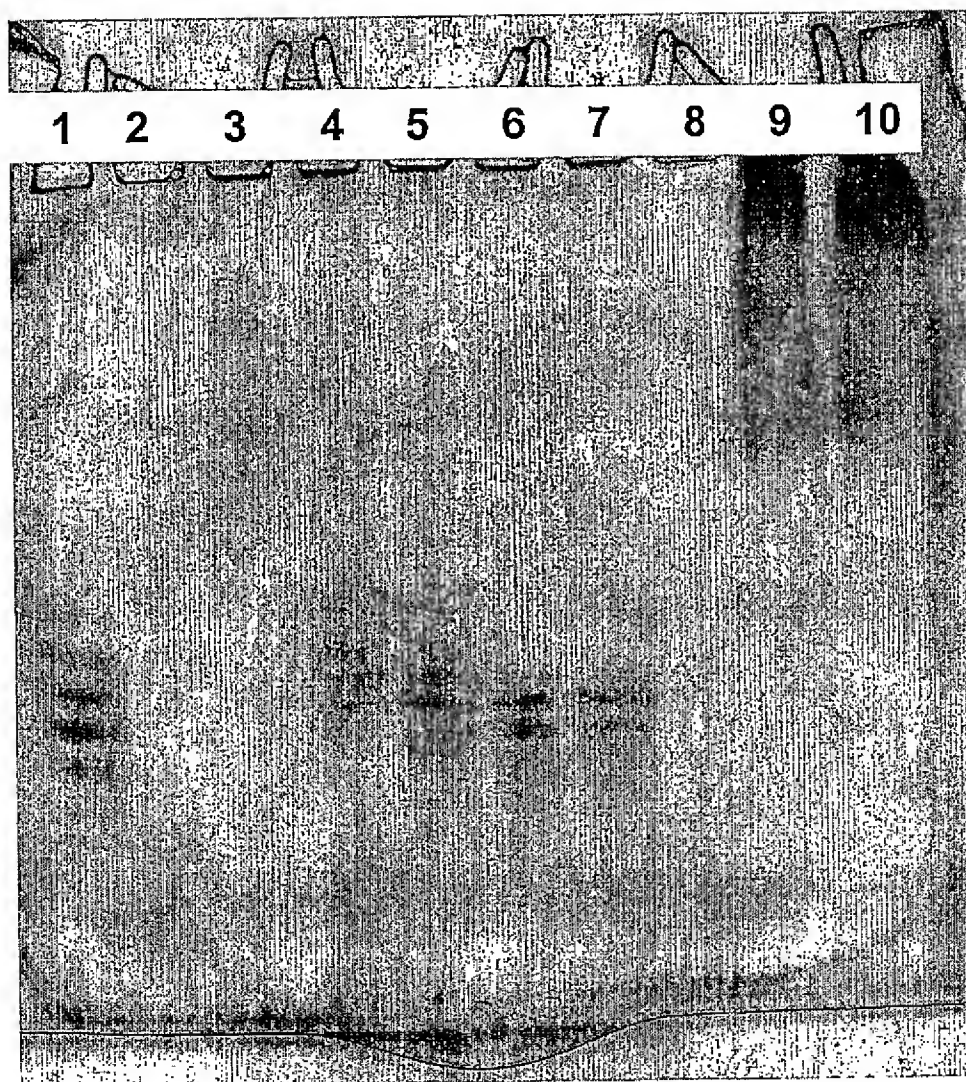


FIG. 111

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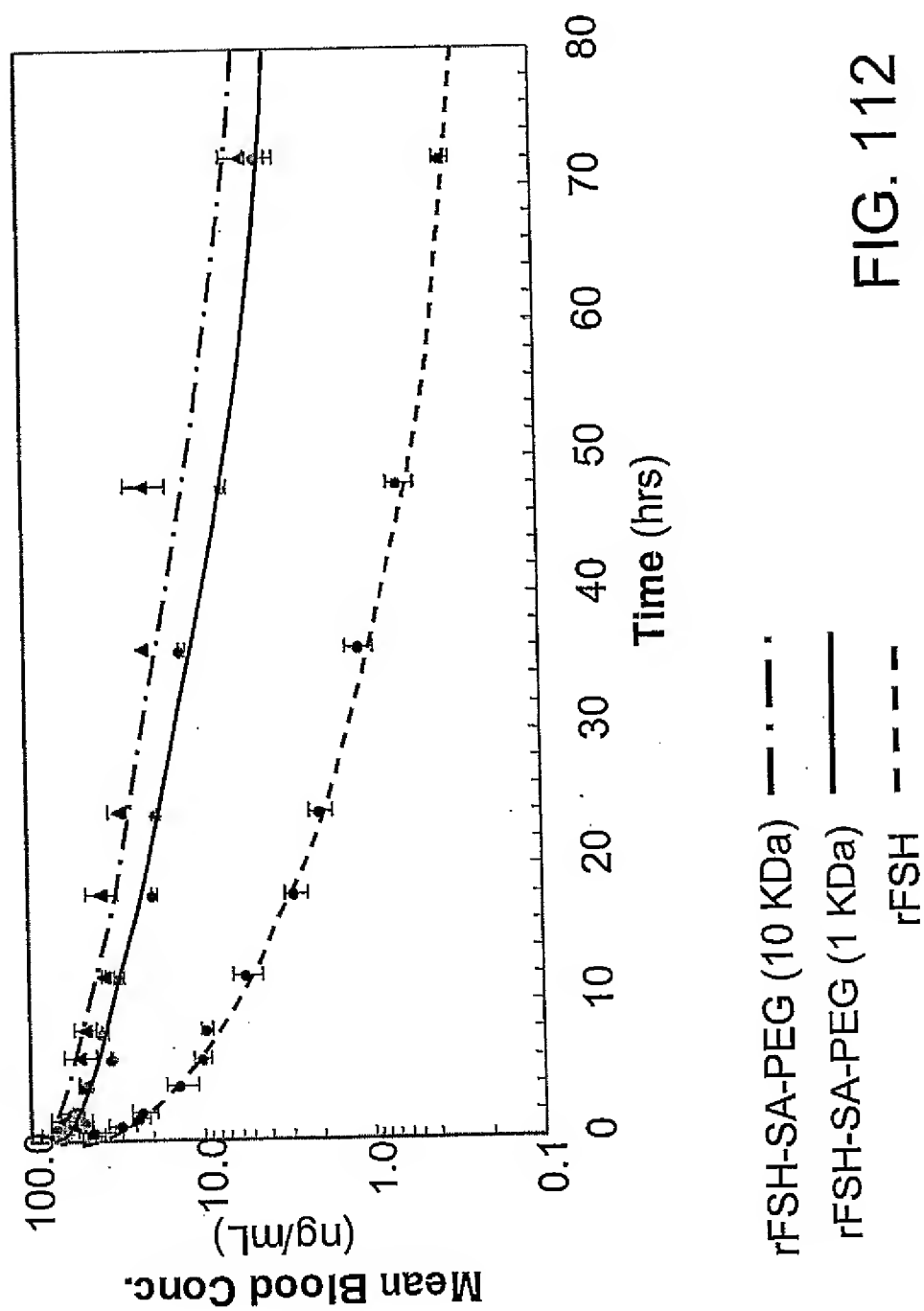


FIG. 112

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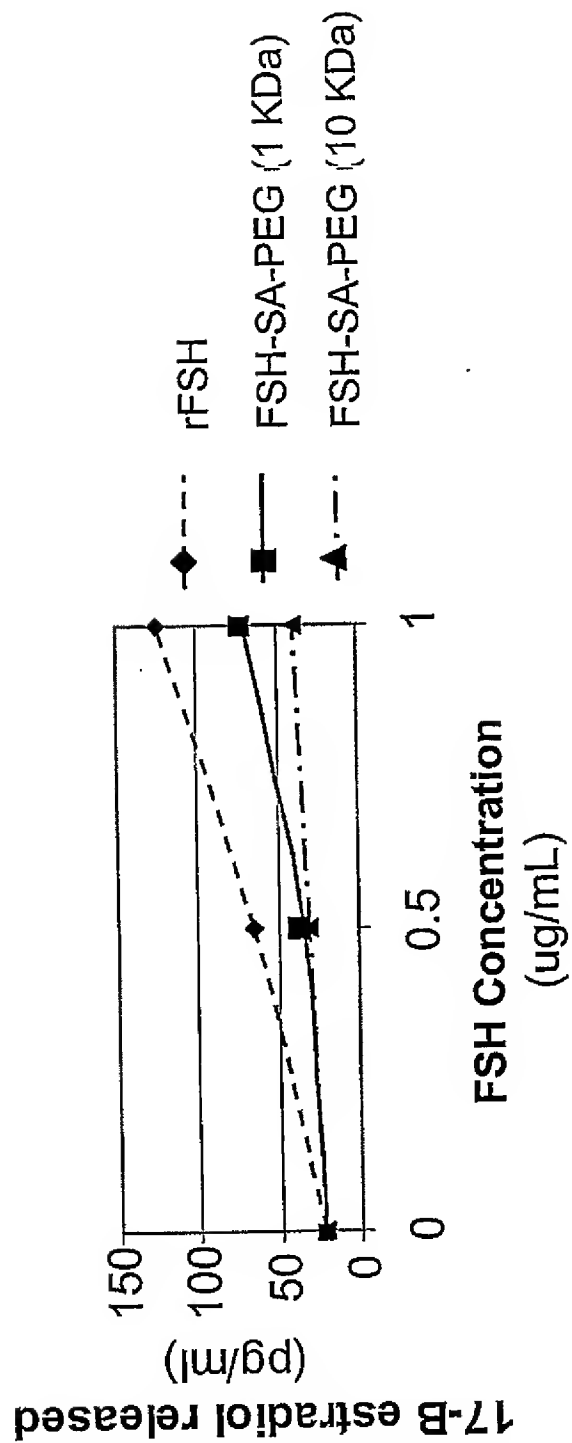


FIG. 113

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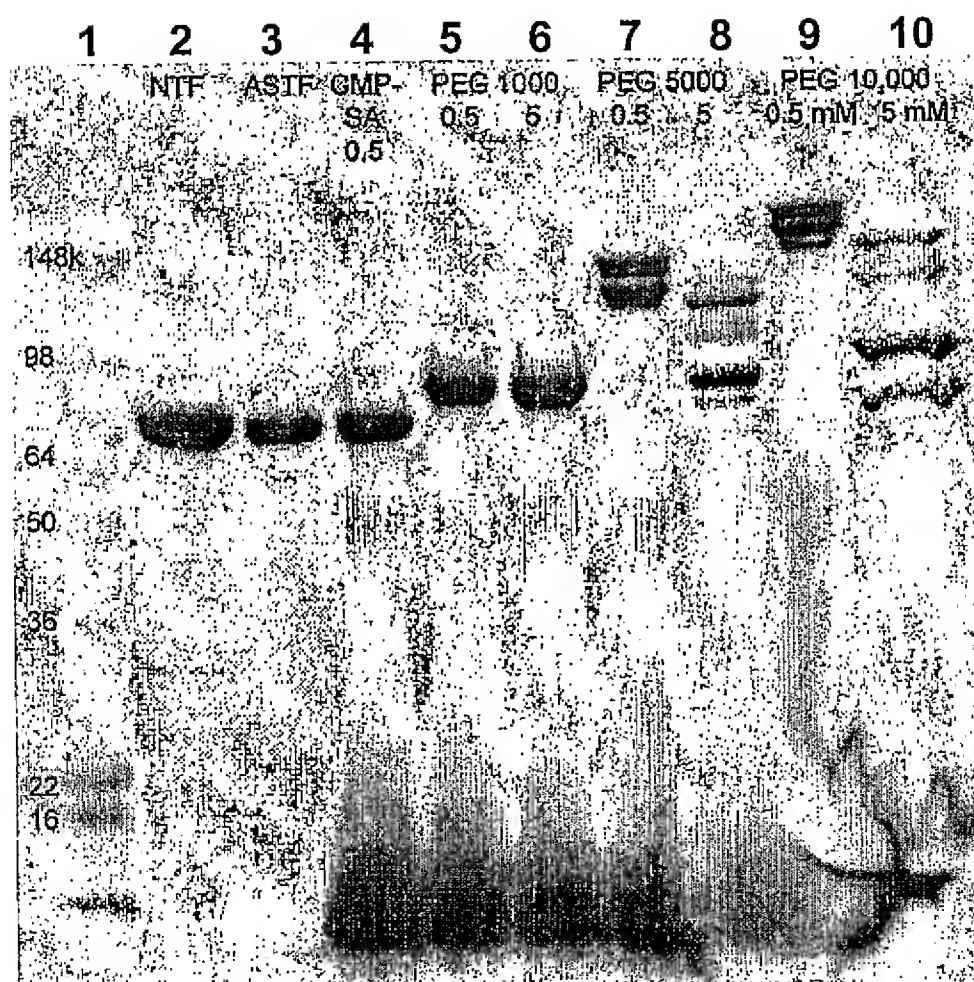


FIG. 114

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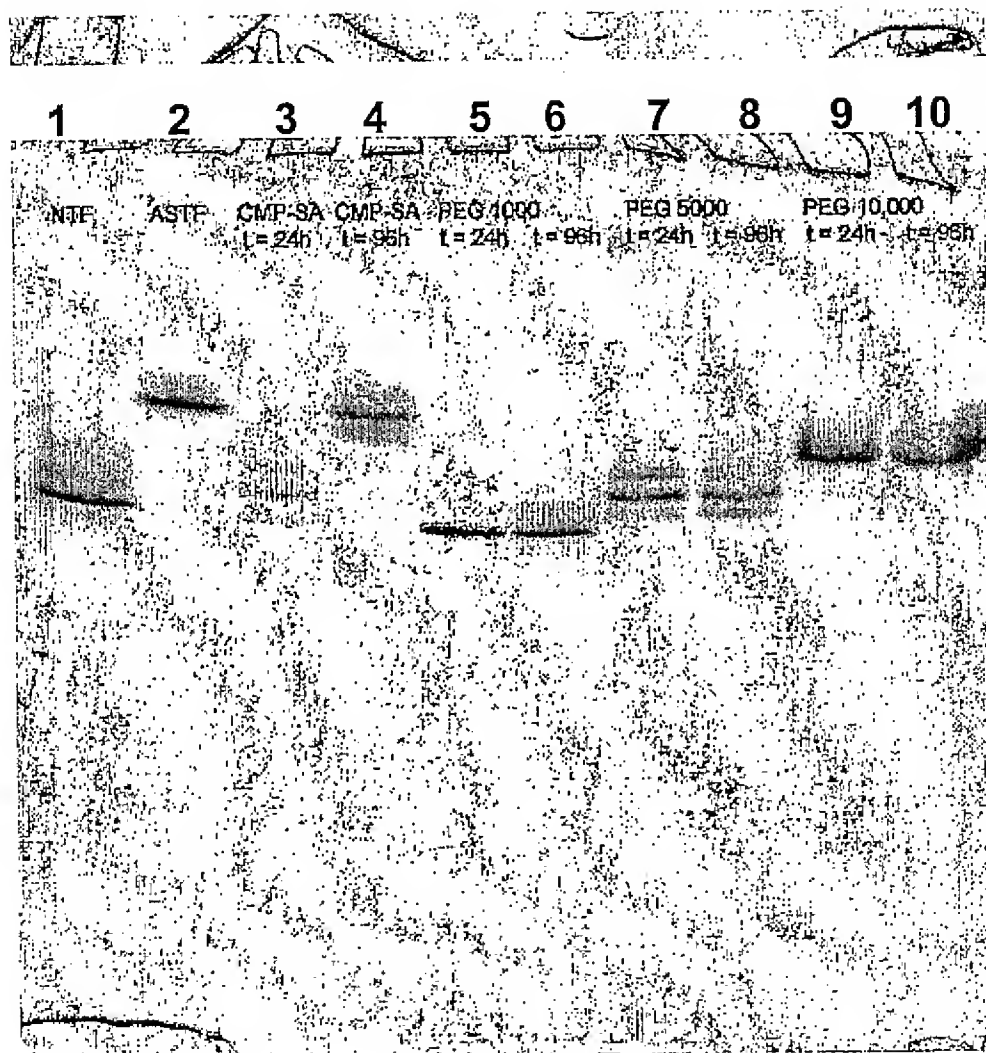


FIG. 115

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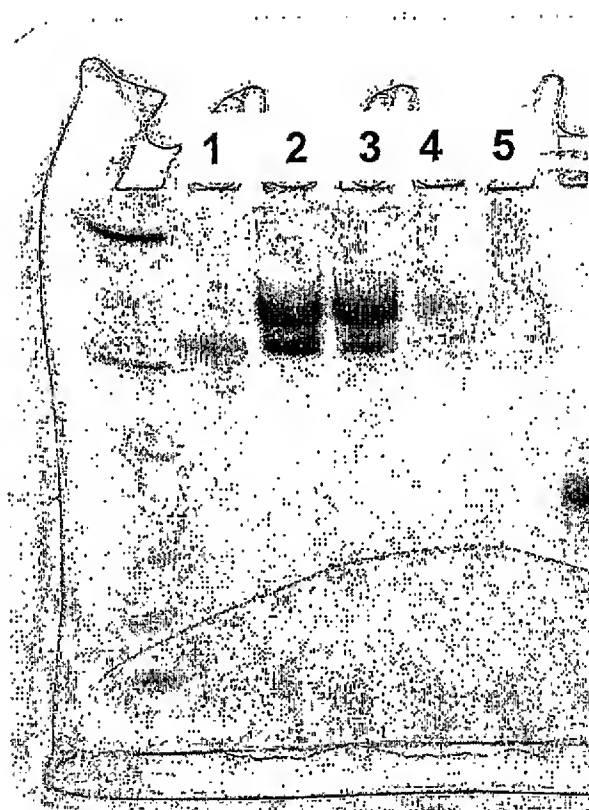


FIG. 116

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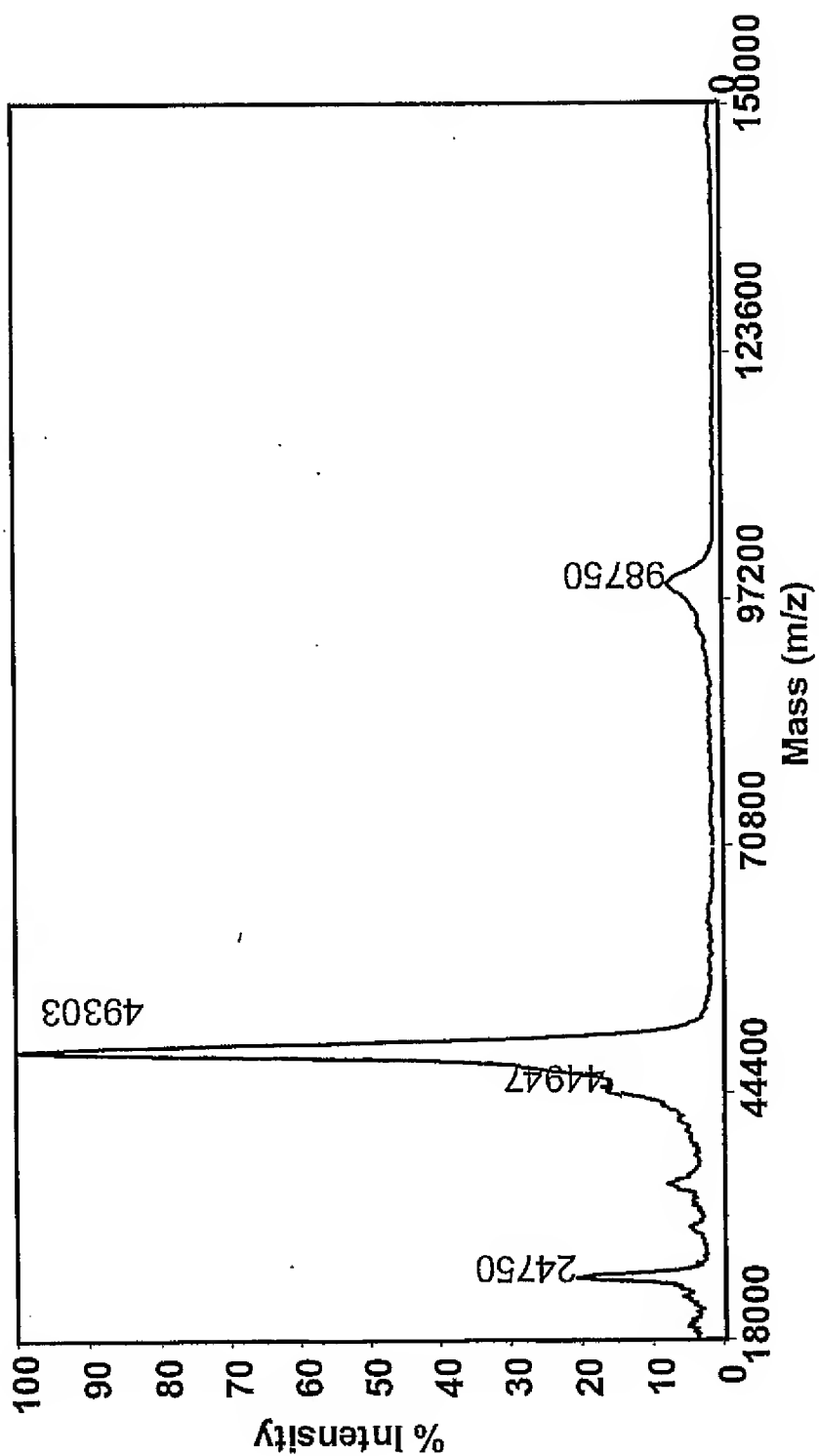


FIG. 117

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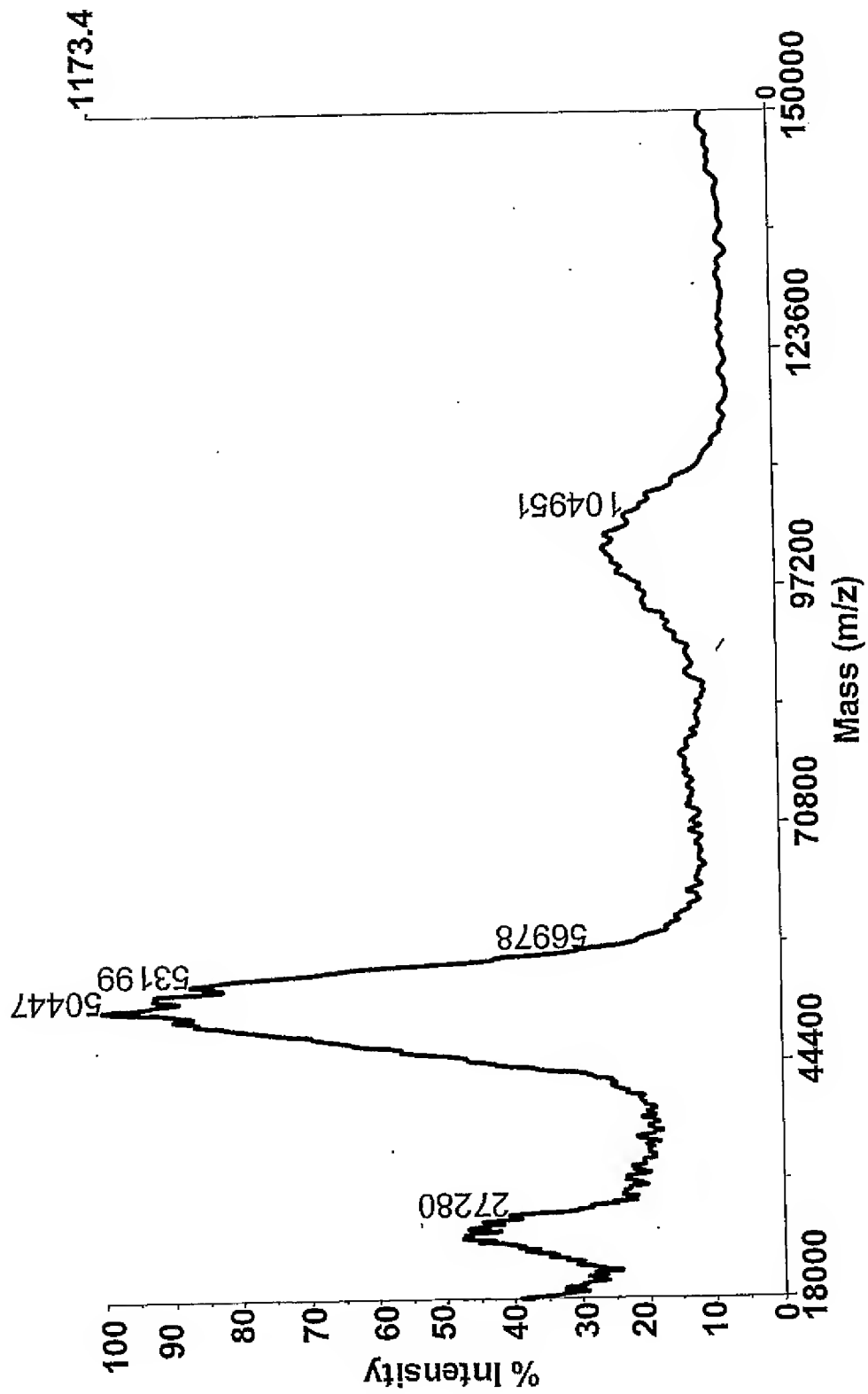


FIG. 118



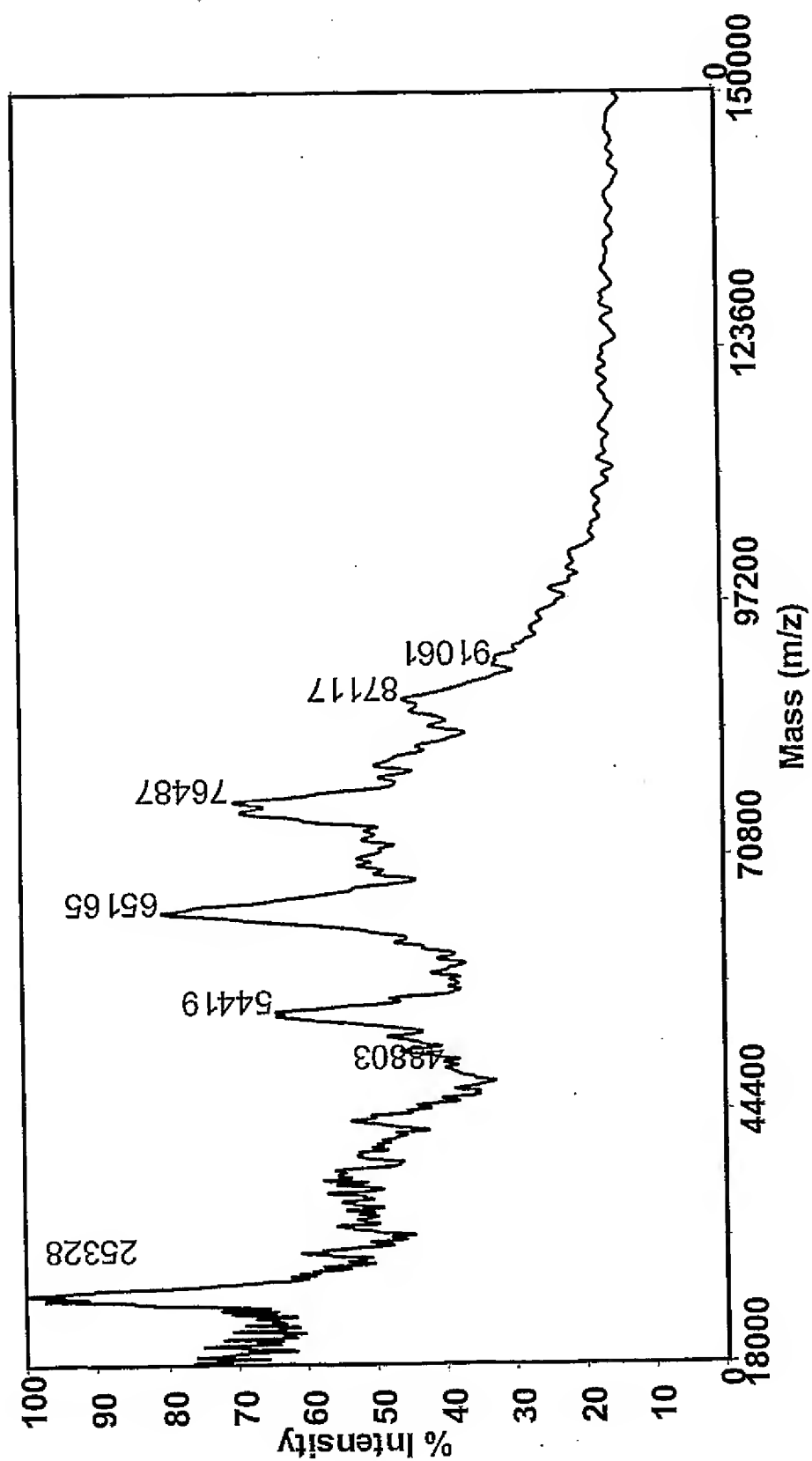


FIG. 119

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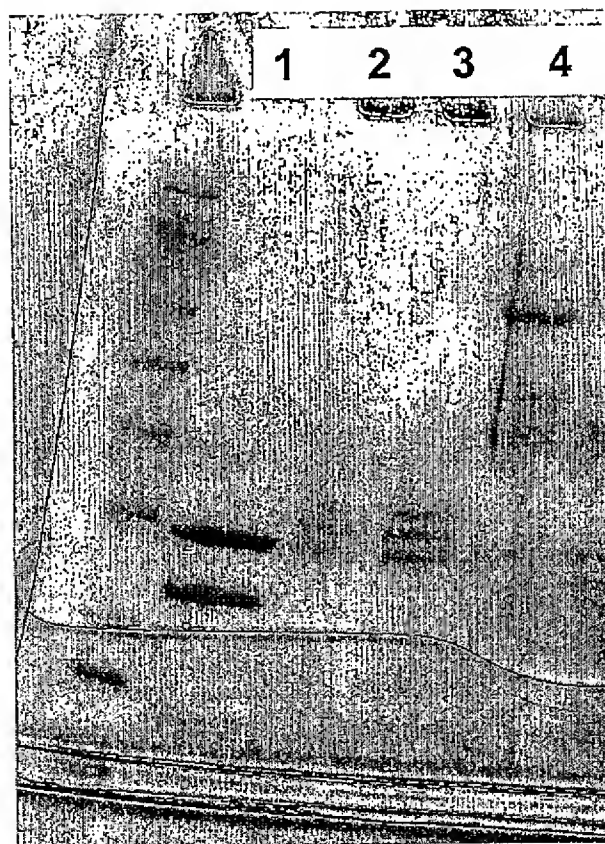


FIG. 120

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FIG. 121

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FIG. 122

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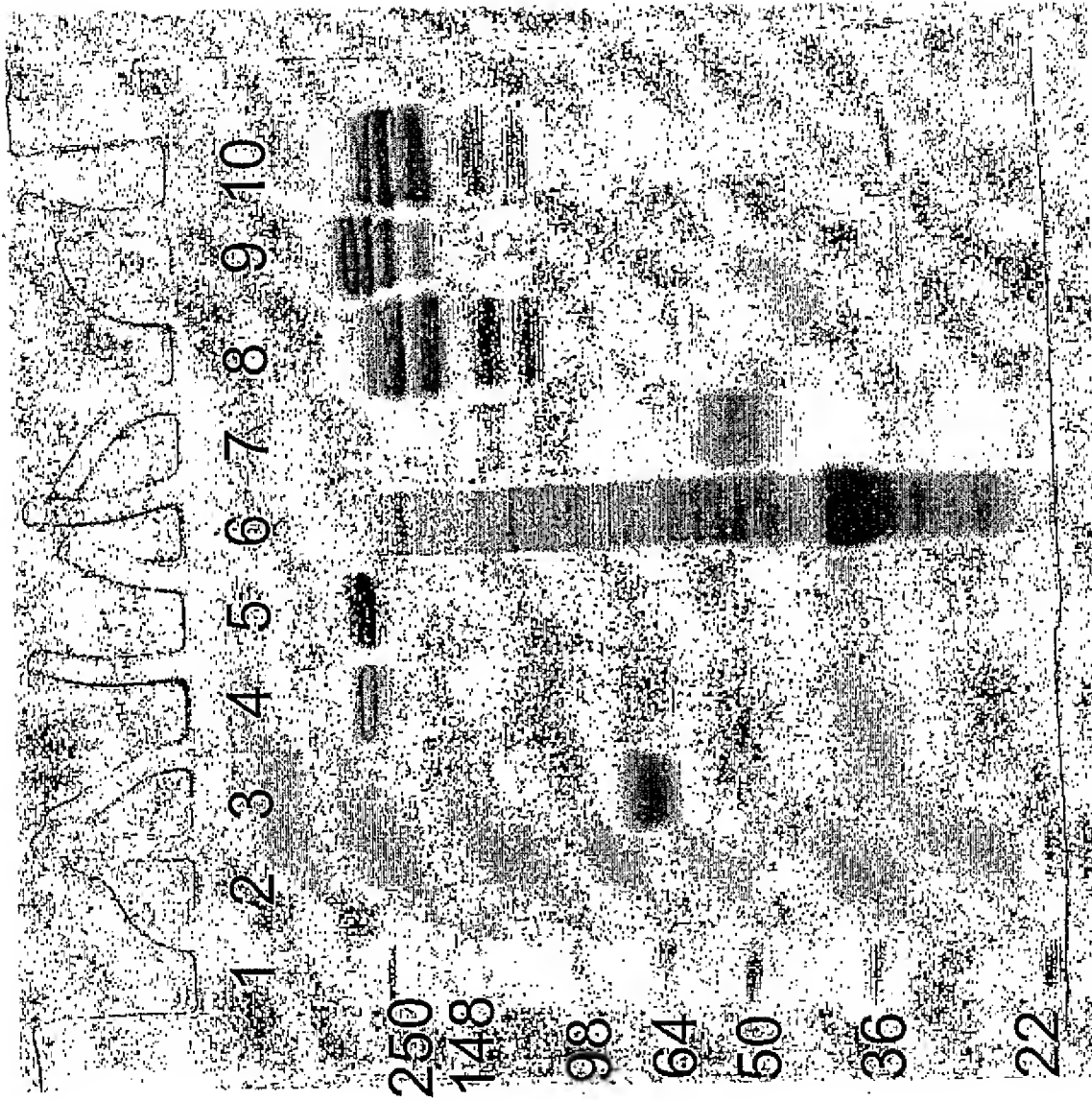


FIG. 123

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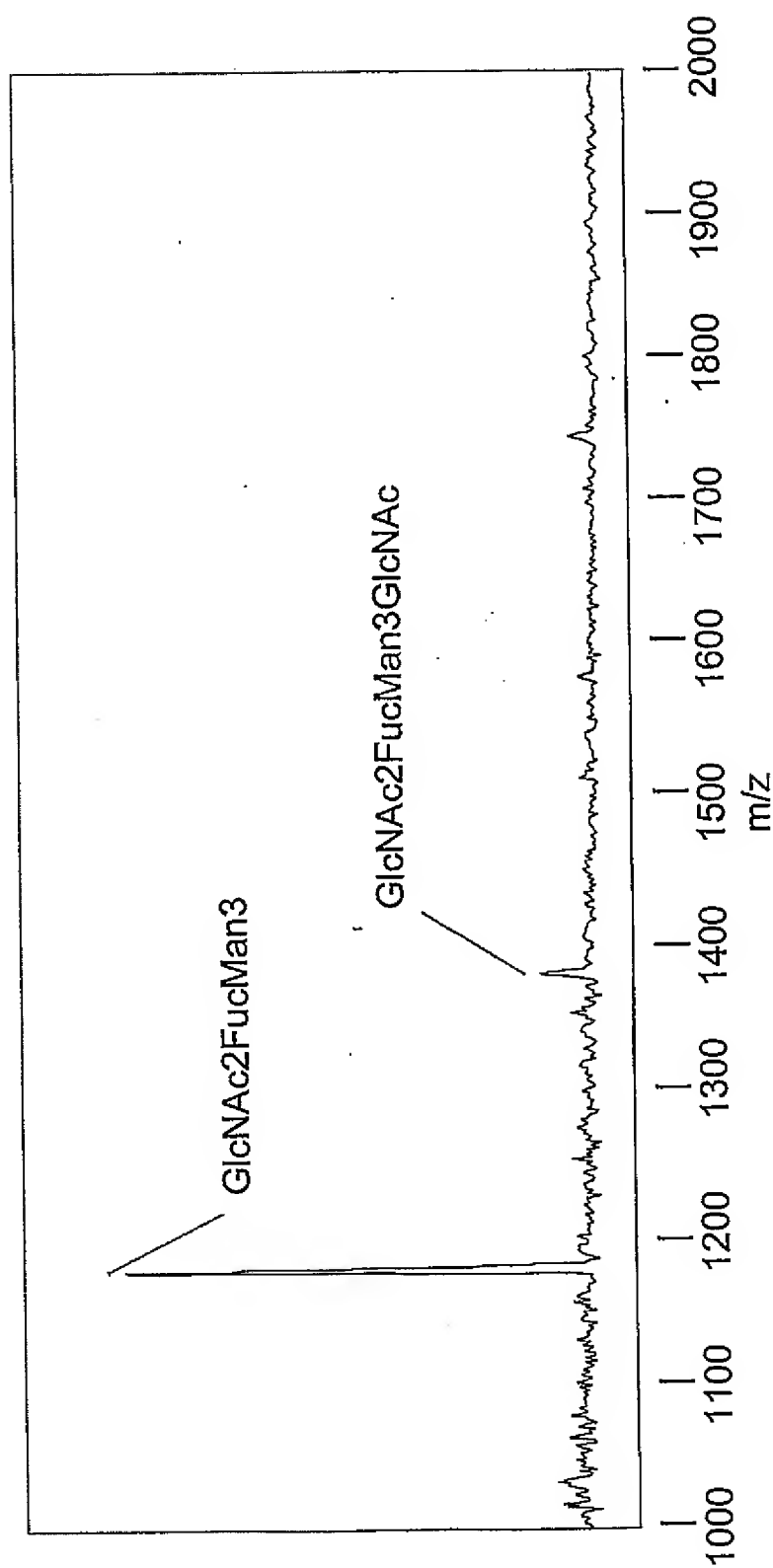


FIG. 124

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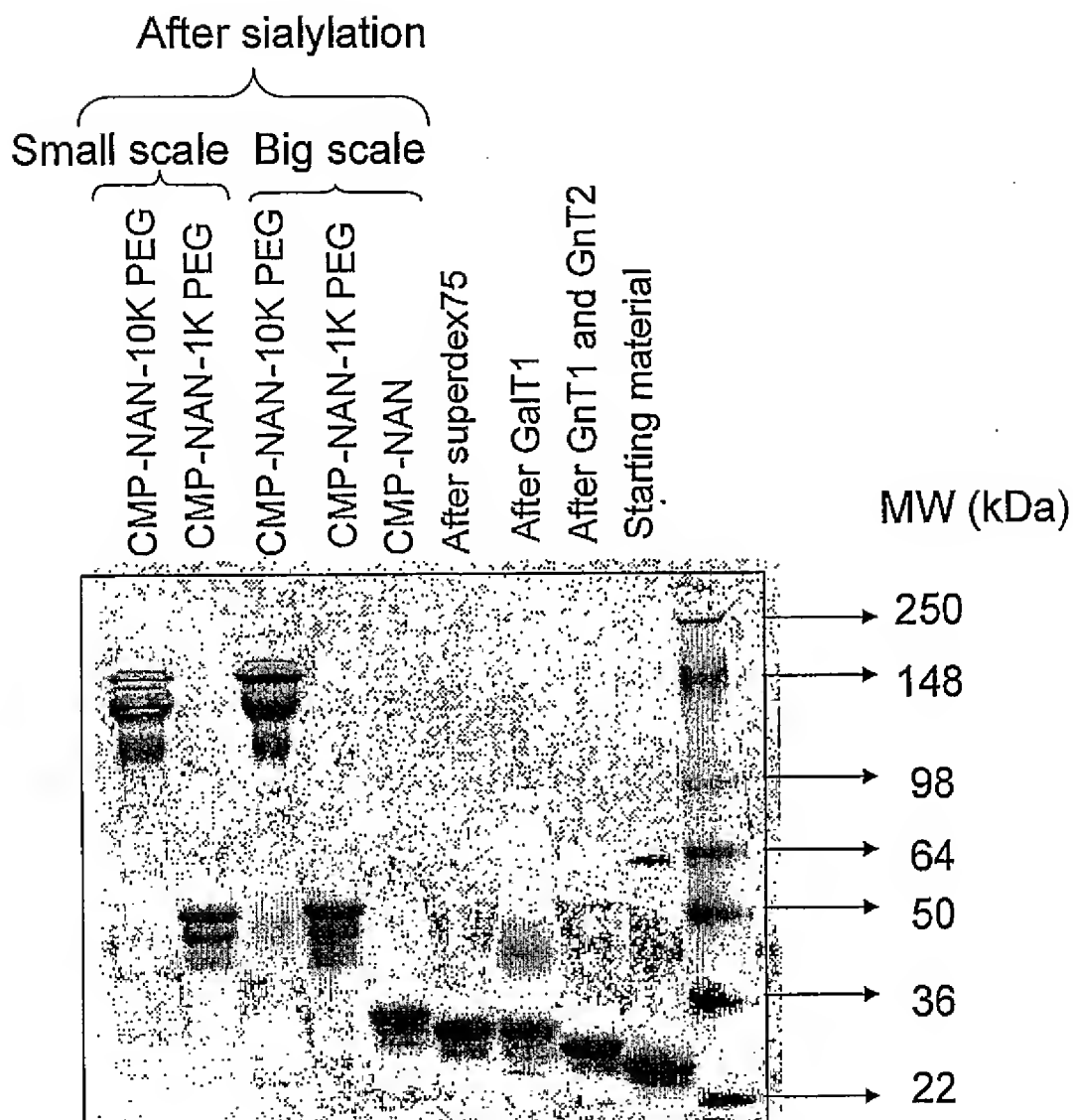


FIG. 125

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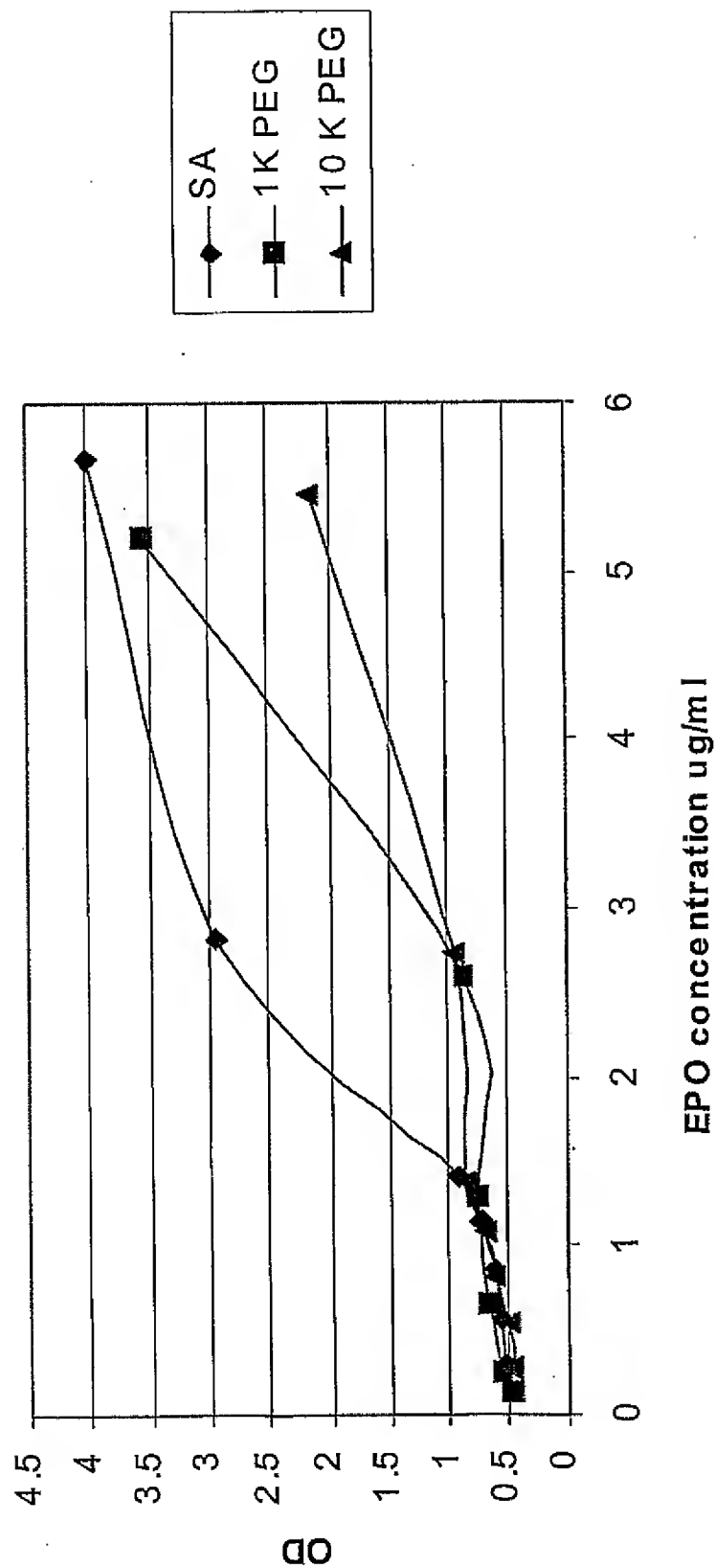


FIG. 126



## SEQUENCE LISTING

<110> Neose Technologies, Inc.  
 DeFrees, Shawn  
 Zopf, David  
 Bayer, Robert  
 Bowe, Caryn  
 Hakes, David  
 Chen, Xi

<120> REMODELING AND GLYCOCONJUGATION OF PEPTIDES

<130> 040853-01-5050WO

<150> US 60/328,523

<151> 2001-10-10

<150> US 60/344,692

<151> 2001-10-19

<150> US 60/334,233

<151> 2001-11-08

<150> US 60/334,301

<151> 2001-11-08

<150> US 60/387,292

<151> 2002-06-07

<150> US 60/391,777

<151> 2002-06-25

<150> US 60/396,594

<151> 2002-07-17

<150> US 60/404,249

<151> 2002-08-16

<150> US 60/407,527

<151> 2002-08-28

<160> 62

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ctgtgccacc ccgaggagct ggtgctgctc ggacactctc tgggcatccc ctgggctccc 180

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 ggccttttcc totaccaggg gctcctgcag gccctggaag ggatctcccc cgagttgggt 300  
 cccaccttgg acacactgca gctggacgtc gccgactttg ccaccacat ctggcagcag 360  
 atggaagaac tgggaatggc ccttgccctg cagcccaccc aggggtgcat gccggccttc 420  
 gcctctgctt tccagcgccg ggcaggaggg gtcttggttg cctcccatct gcagagcttc 480  
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<210> 2  
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 <212> PRT  
 <213> Homo sapiens

<400> 2

Thr Pro Leu Gly Pro Ala Ser Ser Leu Pro Gln Ser Phe Leu Leu Lys  
 1 5 10 15

Cys Leu Glu Gln Val Arg Lys Ile Gln Gly Asp Gly Ala Ala Leu Gln  
 20 25 30

Glu Lys Leu Cys Ala Thr Tyr Lys Leu Cys His Pro Glu Glu Leu Val  
 35 40 45

Leu Leu Gly His Ser Leu Gly Ile Pro Trp Ala Pro Leu Ser Ser Cys  
 50 55 60

Pro Ser Gln Ala Leu Gln Leu Ala Gly Cys Leu Ser Gln Leu His Ser  
 65 70 75 80

Gly Leu Phe Leu Tyr Gln Gly Leu Leu Gln Ala Leu Glu Gly Ile Ser  
 85 90 95

Pro Glu Leu Gly Pro Thr Leu Asp Thr Leu Gln Leu Asp Val Ala Asp  
 100 105 110

Phe Ala Thr Thr Ile Trp Gln Gln Met Glu Glu Leu Gly Met Ala Pro  
 115 120 125

Ala Leu Gln Pro Thr Gln Gly Ala Met Pro Ala Phe Ala Ser Ala Phe  
 130 135 140

Gln Arg Arg Ala Gly Gly Val Leu Val Ala Ser His Leu Gln Ser Phe

145

150

155

160

Leu Glu Val Ser Tyr Arg Val Leu Arg His Leu Ala Gln Pro  
 165 170

&lt;210&gt; 3

&lt;211&gt; 1733

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 3

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 tcaagttaag taaaatgtca atagcctttt aatttaattt ttaattgttt tatcattctt 120  
 tgcaataata aaacattaac ttatactttt ttaatttaat gtatagaata gagatataca 180  
 taggatatgt aaatagatac acagtgtata tgtgattaaa atataatggg agattcaatc 240  
 agaaaaaagt ttctaaaaag gctctggggg aaaagaggaa ggaaacaata atgaaaaaaa 300  
 tgtggtgaga aaaacagctg aaaacccatg taaagagtgt ataaagaaag caaaaagaga 360  
 agtagaaagt aacacagggg catttggaat atgtaaacga gtatgttccc tatttaaggc 420  
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 ctctggtgca tcagctgcaa gtcaagctgc tctgtgggct gtgatctgcc tcaaaccac 600  
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 tcctgcttga aggacagaca tgactttgga tttccccagg aggagtgttg caaccagttc 720  
 caaaaggctg aaaccatccc tgtcctccat gagatgatcc agcagatctt caatctcttc 780  
 agcacaaagg actcatctgc tgcttgggat gagaccctcc tagacaaatt ctacactgaa 840  
 ctctaccagc agctgaatga cctggaagcc tgtgtgatac agggggtggg ggtgacagag 900  
 actcccctga tgaaggagga ctccattctg gctgtgagga aatacttcca aagaatcact 960  
 ctctatctga aagagaagaa atacagccct tgtgcctggg aggttgtcag agcagaaatc 1020  
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 ctggttcaac atggaaatga ttttcattga ttcgtatgcc agctcacctt tttatgatct 1140  
 gccatttcaa agactcatgt ttctgctatg accatgacac gatttaaata ttttcaaatg 1200  
 ttttaggagg tattaatcaa cattgtattc agctottaag gcactagtcc ctacagagg 1260  
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ctatggaact tttgtacttg tttattcttt aaaatgaaat tccaagccta attgtgcaac 1500
ctgattacag aataactggg acacttcatt tgtccatcaa tattatattc aagatataag 1560
taaaaataaa ctttctgtaa accaagttgt atgttggtact caagataaca ggggtgaacct 1620
aacaaataca attctgctct cttgtgtatt tgatttttgt atgaaaaaaaa ctaaaaatgg 1680
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<210> 4
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<212> PRT
<213> Homo sapiens

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<400> 4

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Met Ala Leu Thr Phe Ala Leu Leu Val Ala Leu Leu Val Leu Ser Cys
1           5           10           15

```

```

Lys Ser Ser Cys Ser Val Gly Cys Asp Leu Pro Gln Thr His Ser Leu
          20           25           30

```

```

Gly Ser Arg Arg Thr Leu Met Leu Leu Ala Gln Met Arg Arg Ile Ser
          35           40           45

```

```

Leu Phe Ser Cys Leu Lys Asp Arg His Asp Phe Gly Phe Pro Gln Glu
          50           55           60

```

```

Glu Phe Gly Asn Gln Phe Gln Lys Ala Glu Thr Ile Pro Val Leu His
65           70           75           80

```

```

Glu Met Ile Gln Gln Ile Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser
          85           90           95

```

```

Ala Ala Trp Asp Glu Thr Leu Leu Asp Lys Phe Tyr Thr Glu Leu Tyr
          100          105          110

```

```

Gln Gln Leu Asn Asp Leu Glu Ala Cys Val Ile Gln Gly Val Gly Val
          115          120          125

```

```

Thr Glu Thr Pro Leu Met Lys Glu Asp Ser Ile Leu Ala Val Arg Lys
          130          135          140

```

Tyr Phe Gln Arg Ile Thr Leu Tyr Leu Lys Glu Lys Lys Tyr Ser Pro  
 145 150 155 160

Cys Ala Trp Glu Val Val Arg Ala Glu Ile Met Arg Ser Phe Ser Leu  
 165 170 175

Ser Thr Asn Leu Gln Glu Ser Leu Arg Ser Lys Glu  
 180 185

<210> 5  
 <211> 757  
 <212> DNA  
 <213> Homo sapiens

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 ctctgttggc aattgaatgg gaggttgaa tattgcctca aggacaggat gaactttgac 180  
 atccctgagg agattaagca gctgcagcag ttccagaagg aggacgccgc attgaccatc 240  
 tatgagatgc tccagaacat ctttgctatt ttcagacaag attcatctag cactgggttg 300  
 aatgagacta ttgttgagaa cctcctggct aatgtctatc atcagataaa ccactctgaag 360  
 acagtcctgg aagaaaaact ggagaaagaa gattttacca ggggaaaact catgagcagt 420  
 ctgcacctga aaagatatta tgggaggatt ctgcattacc tgaaggccaa ggagtacagt 480  
 cactgtgcct ggaccatagt cagagtggaa atcctaagga acttttactt cattaacaga 540  
 cttacagggtt acctccgaaa ctgaagatct cctagcctgt ccctctggga ctggacaatt 600  
 gcttcaagca ttcttcaacc agcagatgct gtttaagtga ctgatggcta atgtactgca 660  
 aatgaaagga cactagaaga ttttgaaatt tttattaaat tatgagttat ttttatttat 720  
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 <212> PRT  
 <213> Homo sapiens

<400> 6

Met Thr Asn Lys Cys Leu Leu Gln Ile Ala Leu Leu Leu Cys Phe Ser  
 1 5 10 15

Thr Thr Ala Leu Ser Met Ser Tyr Asn Leu Leu Gly Phe Leu Gln Arg  
 20 25 30

Ser Ser Asn Phe Gln Cys Gln Lys Leu Leu Trp Gln Leu Asn Gly Arg  
 35 40 45

Leu Glu Tyr Cys Leu Lys Asp Arg Met Asn Phe Asp Ile Pro Glu Glu  
 50 55 60

Ile Lys Gln Leu Gln Gln Phe Gln Lys Glu Asp Ala Ala Leu Thr Ile  
 65 70 75 80

Tyr Glu Met Leu Gln Asn Ile Phe Ala Ile Phe Arg Gln Asp Ser Ser  
 85 90 95

Ser Thr Gly Trp Asn Glu Thr Ile Val Glu Asn Leu Leu Ala Asn Val  
 100 105 110

Tyr His Gln Ile Asn His Leu Lys Thr Val Leu Glu Glu Lys Leu Glu  
 115 120 125

Lys Glu Asp Phe Thr Arg Gly Lys Leu Met Ser Ser Leu His Leu Lys  
 130 135 140

Arg Tyr Tyr Gly Arg Ile Leu His Tyr Leu Lys Ala Lys Glu Tyr Ser  
 145 150 155 160

His Cys Ala Trp Thr Ile Val Arg Val Glu Ile Leu Arg Asn Phe Tyr  
 165 170 175

Phe Ile Asn Arg Leu Thr Gly Tyr Leu Arg Asn  
 180 185

<210> 7  
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 <213> Homo sapiens

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 gcgttccttg aggagctgcg gccgggctcc ctggagaggg agtgcaagga ggagcagtgc 180  
 tccttcgagg aggcccgga gatcttcaag gacgcggaga ggacgaagct gttctggatt 240

```

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gaccagctcc agtcctatat ctgcttctgc ctccctgcct tcgagggccg gaactgtgag    360
acgcacaagg atgaccagct gatctgtgtg aacgagaacg gcggctgtga gcagtactgc    420
agtgaccaca cgggcaccaa gcgctcctgt cgggtgccacg aggggtactc tctgctggca    480
gacggggtgt cctgcacacc cacagttgaa tatccatgtg gaaaaatacc tattctagaa    540
aaaagaaatg ccagcaaacc ccaaggccga attgtggggg gcaaggtgtg ccccaaaggg    600
gagtgtccat ggcaggtcct gttgttggtg aatggagctc agttgtgtgg ggggaccctg    660
atcaacacca tctgggtggt ctccgcggcc cactgtttcg aaaaaatcaa gaactggagg    720
aacctgatcg cgggtgctggg cgagcacgac ctccagcagc acgacgggga tgagcagagc    780
cggcggtgtg cgcaggtcat catcccagc acgtacgtcc cgggcaccac caaccacgac    840
atcgcgctgc tccgcctgca ccagccctg gtcctcactg accatgtggt gccctctctg    900
ctgcccgaac ggacgttctc tgagaggacg ctggccttcg tgcgcttctc attggtcagc    960
ggctggggcc agctgctgga ccgtggcgcc acggccctgg agtcatggt gctcaacgtg   1020
ccccggctga tgaccagga ctgcctgcag cagtcaogga aggtgggaga ctccccaaat   1080
atcacggagt acatgttctg tgccggctac tcggatggca gcaaggactc ctgcaagggg   1140
gacagtggag gccacatgc caccactac cggggcacgt ggtacctgac gggcatcgtc   1200
agctggggcc agggctgcgc aaccgtgggc cactttgggg tgtacaccag ggtctcccag   1260
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gccccatttc cc                                                         1332

```

<210> 8  
 <211> 444  
 <212> PRT  
 <213> Homo sapiens

<400> 8

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Met Val Ser Gln Ala Leu Arg Leu Leu Cys Leu Leu Leu Gly Leu Gln
1           5           10          15

```

```

Gly Cys Leu Ala Ala Val Phe Val Thr Gln Glu Glu Ala His Gly Val
20          25          30

```

```

Leu His Arg Arg Arg Arg Ala Asn Ala Phe Leu Glu Glu Leu Arg Pro
35          40          45

```

Gly Ser Leu Glu Arg Glu Cys Lys Glu Glu Gln Cys Ser Phe Glu Glu  
 50 55 60

Ala Arg Glu Ile Phe Lys Asp Ala Glu Arg Thr Lys Leu Phe Trp Ile  
 65 70 75 80

Ser Tyr Ser Asp Gly Asp Gln Cys Ala Ser Ser Pro Cys Gln Asn Gly  
 85 90 95

Gly Ser Cys Lys Asp Gln Leu Gln Ser Tyr Ile Cys Phe Cys Leu Pro  
 100 105 110

Ala Phe Glu Gly Arg Asn Cys Glu Thr His Lys Asp Asp Gln Leu Ile  
 115 120 125

Cys Val Asn Glu Asn Gly Gly Cys Glu Gln Tyr Cys Ser Asp His Thr  
 130 135 140

Gly Thr Lys Arg Ser Cys Arg Cys His Glu Gly Tyr Ser Leu Leu Ala  
 145 150 155 160

Asp Gly Val Ser Cys Thr Pro Thr Val Glu Tyr Pro Cys Gly Lys Ile  
 165 170 175

Pro Ile Leu Glu Lys Arg Asn Ala Ser Lys Pro Gln Gly Arg Ile Val  
 180 185 190

Gly Gly Lys Val Cys Pro Lys Gly Glu Cys Pro Trp Gln Val Leu Leu  
 195 200 205

Leu Val Asn Gly Ala Gln Leu Cys Gly Gly Thr Leu Ile Asn Thr Ile  
 210 215 220

Trp Val Val Ser Ala Ala His Cys Phe Asp Lys Ile Lys Asn Trp Arg  
 225 230 235 240

Asn Leu Ile Ala Val Leu Gly Glu His Asp Leu Ser Glu His Asp Gly  
 245 250 255

Asp Glu Gln Ser Arg Arg Val Ala Gln Val Ile Ile Pro Ser Thr Tyr  
 260 265 270



Val Pro Gly Thr Thr Asn His Asp Ile Ala Leu Leu Arg Leu His Gln  
 275 280 285

Pro Val Val Leu Thr Asp His Val Val Pro Leu Cys Leu Pro Glu Arg  
 290 295 300

Thr Phe Ser Glu Arg Thr Leu Ala Phe Val Arg Phe Ser Leu Val Ser  
 305 310 315 320

Gly Trp Gly Gln Leu Leu Asp Arg Gly Ala Thr Ala Leu Glu Leu Met  
 325 330 335

Val Leu Asn Val Pro Arg Leu Met Thr Gln Asp Cys Leu Gln Gln Ser  
 340 345 350

Arg Lys Val Gly Asp Ser Pro Asn Ile Thr Glu Tyr Met Phe Cys Ala  
 355 360 365

Gly Tyr Ser Asp Gly Ser Lys Asp Ser Cys Lys Gly Asp Ser Gly Gly  
 370 375 380

Pro His Ala Thr His Tyr Arg Gly Thr Trp Tyr Leu Thr Gly Ile Val  
 385 390 395 400

Ser Trp Gly Gln Gly Cys Ala Thr Val Gly His Phe Gly Val Tyr Thr  
 405 410 415

Arg Val Ser Gln Tyr Ile Glu Trp Leu Gln Lys Leu Met Arg Ser Glu  
 420 425 430

Pro Arg Pro Gly Val Leu Leu Arg Ala Pro Phe Pro  
 435 440

<210> 9  
 <211> 1437  
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 <213> Homo sapiens

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 ctgaatcggc caaagaggta taattcaggt aaattggaag agtttggtca agggaaacott 180

gagagagaat gtatggaaga aaagtgtagt tttgaagaac cacgagaagt ttttgaaaac 240  
 actgaaaaga caactgaatt ttggaagcag tatgttgatg gagatcagtg tgagtccaat 300  
 ccatgtttta atggcggcag ttgcaaggat gacattaatt cctatgaatg ttggtgtccc 360  
 tttggatttg aaggaaagaa ctgtgaatta gatgtaacat gtaacattaa gaatggcaga 420  
 tgcgagcagt tttgtaaaaa tagtgctgat aacaagggtg tttgctcctg tactgagggg 480  
 tatcgacttg cagaaaacca gaagtcctgt gaaccagcag tgccatttcc atgtggaaga 540  
 gtttctgttt cacaaacttc taagctcacc cgtgctgagg ctgtttttcc tgatgtggac 600  
 tatgtaaatc ctactgaagc tgaaaccatt ttggataaca tcactcaagg caccatca 660  
 tttaatgact tcactcgggt tgttggtgga gaagatgcc aaccagggtca attcccttgg 720  
 caggttgttt tgaatggtaa agttgatgca ttctgtggag gctctatcgt taatgaaaaa 780  
 tggattgtaa ctgctgcccc ctgtgttgaa actgggtgta aaattacagt tgcgcaggt 840  
 gaacataata ttgaggagac agaacataca gagcaaaagc gaaatgtgat tcgagcaatt 900  
 attcctcacc acaactacaa tgcagctatt aataagtaca accatgacat tgcccttctg 960  
 gaactggacg aacccttagt gctaaacagc tacgttacac ctatttgcac tgctgacaag 1020  
 gaatacacga acatcttctt caaatttgga tctggctatg taagtggctg ggcaagagtc 1080  
 ttccacaaag ggagatcagc tttagttctt cagtacctta gagttccact tgttgaccga 1140  
 gccacatgtc ttgatctac aaagttcacc atctataaca acatgttctg tgctggcttc 1200  
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 aaatatggaa tatataccaa ggtatcccggt tatgtcaact ggattaagga aaaaacaaag 1380  
 ctcaactaat gaaagatgga ttccaaggt taattcattg gaattgaaaa ttaacag 1437

&lt;210&gt; 10

&lt;211&gt; 462

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 10

Met Gln Arg Val Asn Met Ile Met Ala Glu Ser Pro Ser Leu Ile Thr  
 1 5 10 15

Ile Cys Leu Leu Gly Tyr Leu Leu Ser Ala Glu Cys Thr Val Phe Leu  
 20 25 30

Asp His Glu Asn Ala Asn Lys Ile Leu Asn Arg Pro Lys Arg Tyr Asn  
 35 40 45

Ser Gly Lys Leu Glu Glu Phe Val Gln Gly Asn Leu Glu Arg Glu Cys  
 50 55 60

Met Glu Glu Lys Cys Ser Phe Glu Glu Pro Arg Glu Val Phe Glu Asn  
 65 70 75 80

Thr Glu Lys Thr Thr Glu Phe Trp Lys Gln Tyr Val Asp Gly Asp Gln  
 85 90 95

Cys Glu Ser Asn Pro Cys Leu Asn Gly Gly Ser Cys Lys Asp Asp Ile  
 100 105 110

Asn Ser Tyr Glu Cys Trp Cys Pro Phe Gly Phe Glu Gly Lys Asn Cys  
 115 120 125

Glu Leu Asp Val Thr Cys Asn Ile Lys Asn Gly Arg Cys Glu Gln Phe  
 130 135 140

Cys Lys Asn Ser Ala Asp Asn Lys Val Val Cys Ser Cys Thr Glu Gly  
 145 150 155 160

Tyr Arg Leu Ala Glu Asn Gln Lys Ser Cys Glu Pro Ala Val Pro Phe  
 165 170 175

Pro Cys Gly Arg Val Ser Val Ser Gln Thr Ser Lys Leu Thr Arg Ala  
 180 185 190

Glu Ala Val Phe Pro Asp Val Asp Tyr Val Asn Pro Thr Glu Ala Glu  
 195 200 205

Thr Ile Leu Asp Asn Ile Thr Gln Gly Thr Gln Ser Phe Asn Asp Phe  
 210 215 220

Thr Arg Val Val Gly Gly Glu Asp Ala Lys Pro Gly Gln Phe Pro Trp  
 225 230 235 240

Gln Val Val Leu Asn Gly Lys Val Asp Ala Phe Cys Gly Gly Ser Ile  
 245 250 255

Val Asn Glu Lys Trp Ile Val Thr Ala Ala His Cys Val Glu Thr Gly  
 260 265 270

Val Lys Ile Thr Val Val Ala Gly Glu His Asn Ile Glu Glu Thr Glu  
 275 280 285

His Thr Glu Gln Lys Arg Asn Val Ile Arg Ala Ile Ile Pro His His  
 290 295 300

Asn Tyr Asn Ala Ala Ile Asn Lys Tyr Asn His Asp Ile Ala Leu Leu  
 305 310 315 320

Glu Leu Asp Glu Pro Leu Val Leu Asn Ser Tyr Val Thr Pro Ile Cys  
 325 330 335

Ile Ala Asp Lys Glu Tyr Thr Asn Ile Phe Leu Lys Phe Gly Ser Gly  
 340 345 350

Tyr Val Ser Gly Trp Ala Arg Val Phe His Lys Gly Arg Ser Ala Leu  
 355 360 365

Val Leu Gln Tyr Leu Arg Val Pro Leu Val Asp Arg Ala Thr Cys Leu  
 370 375 380

Arg Ser Thr Lys Phe Thr Ile Tyr Asn Asn Met Phe Cys Ala Gly Phe  
 385 390 395 400

His Glu Gly Gly Arg Asp Ser Cys Gln Gly Asp Ser Gly Gly Pro His  
 405 410 415

Val Thr Glu Val Glu Gly Thr Ser Phe Leu Thr Gly Ile Ile Ser Trp  
 420 425 430

Gly Glu Glu Cys Ala Met Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val  
 435 440 445

Ser Arg Tyr Val Asn Trp Ile Lys Glu Lys Thr Lys Leu Thr  
 450 455 460

<210> 11  
 <211> 603  
 <212> DNA  
 <213> Homo sapiens

<400> 11  
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 gttctccatt ccgctcctga tgtgcaggat tgcccagaat gcacgctaca ggaaaaccca 120  
 ttcttctccc agccgggtgc cccaatactt cagtgcattg gctgctgctt ctctagagca 180  
 tatccactc cactaagggtc caagaagacg atgttgggtcc aaaagaacgt cacctcagag 240  
 tccacttgct gtgtagctaa atcatataac agggtcacag taatggggggg tttcaaagt 300  
 gagaaccaca cggcgtgcc actgcagtact tgttattatc acaaacttta aatgttttac 360  
 caagtgcgtg cttgatgact gctgattttc tggaatggaa aattaagttg tttagtgttt 420  
 atggctttgt gagataaaac tctccttttc cttaccatac cactttgaca cgcttcaagg 480  
 atatactgca gctttactgc cttcctcctt atcctacagt acaatcagca gtctagttct 540  
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 atc 603

<210> 12  
 <211> 116  
 <212> PRT  
 <213> Homo sapiens

<400> 12  
 Met Asp Tyr Tyr Arg Lys Tyr Ala Ala Ile Phe Leu Val Thr Leu Ser  
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 Val Phe Leu His Val Leu His Ser Ala Pro Asp Val Gln Asp Cys Pro  
 20 25 30  
 Glu Cys Thr Leu Gln Glu Asn Pro Phe Phe Ser Gln Pro Gly Ala Pro  
 35 40 45  
 Ile Leu Gln Cys Met Gly Cys Cys Phe Ser Arg Ala Tyr Pro Thr Pro  
 50 55 60  
 Leu Arg Ser Lys Lys Thr Met Leu Val Gln Lys Asn Val Thr Ser Glu  
 65 70 75 80  
 Ser Thr Cys Cys Val Ala Lys Ser Tyr Asn Arg Val Thr Val Met Gly  
 85 90 95  
 Gly Phe Lys Val Glu Asn His Thr Ala Cys His Cys Ser Thr Cys Tyr  
 100 105 110

Tyr His Lys Ser  
115

<210> 13  
<211> 390  
<212> DNA  
<213> Homo sapiens

<400> 13  
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tgtgagctga ccaacatcac cattgcaata gagaaagaag aatgtcgttt ctgcataagc 120  
atcaacacca cttggtgtgc tggctactgc tacaccaggg atctggtgta taaggaccca 180  
gccaggccca aaatccagaa aacatgtacc ttcaaggaac tggatatatga aacagtgaga 240  
gtgccccggt gtgctcacca tgcagattcc ttgtatacat acccagtggc caccagtgt 300  
cactgtggca agtgtgacag cgacagcact gattgtactg tgcgaggcct ggggccagc 360  
tactgctcct ttggtgaaat gaaagaataa 390

<210> 14  
<211> 129  
<212> PRT  
<213> Homo sapiens

<400> 14

Met Lys Thr Leu Gln Phe Phe Phe Leu Phe Cys Cys Trp Lys Ala Ile  
1 5 10 15

Cys Cys Asn Ser Cys Glu Leu Thr Asn Ile Thr Ile Ala Ile Glu Lys  
20 25 30

Glu Glu Cys Arg Phe Cys Ile Ser Ile Asn Thr Thr Trp Cys Ala Gly  
35 40 45

Tyr Cys Tyr Thr Arg Asp Leu Val Tyr Lys Asp Pro Ala Arg Pro Lys  
50 55 60

Ile Gln Lys Thr Cys Thr Phe Lys Glu Leu Val Tyr Glu Thr Val Arg  
65 70 75 80

Val Pro Gly Cys Ala His His Ala Asp Ser Leu Tyr Thr Tyr Pro Val  
85 90 95

Ala Thr Gln Cys His Cys Gly Lys Cys Asp Ser Asp Ser Thr Asp Cys  
 100 105 110

Thr Val Arg Gly Leu Gly Pro Ser Tyr Cys Ser Phe Gly Glu Met Lys  
 115 120 125

Glu

<210> 15  
 <211> 1342  
 <212> DNA  
 <213> Homo sapiens

<400> 15  
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 cggccctctc ctccaggccc gtggggctgg ccttgcaccg ccgagcttcc cgggatgagg 120  
 gcccccggtg tggtcacccg gcgcgccccca ggtcgctgag ggaccccggc caggcgcgga 180  
 gatgggggtg cacgaatgtc ctgcctggct gtggcttctc ctgtccctgc tgtcgctccc 240  
 totgggcctc ccagtcctgg gcgccccacc acgcctcctc tgtgacagcc gagtcctgga 300  
 gaggtacctc ttggaggcca aggaggccga gaatatcacg accgggctgtg ctgaacactg 360  
 cagcttgaat gagaatatca ctgtcccaga caccaaagtt aatttctatg cctggaagag 420  
 gatggaggtc gggcagcagg ccgtagaagt ctggcagggc ctggccctgc tgtcggaagc 480  
 tgtcctgcgg ggccaggccc tgttgggtcaa ctcttcccag ccgtgggagc ccttgcagct 540  
 gcatgtggat aaagccgtca gtggccttcg cagcctcacc actctgcttc gggctctgcg 600  
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 cactgctgac actttccgca aactcttcg agtctactcc aatttctctc ggggaaagct 720  
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 ggcatatcca ccacctccct caccaacatt gcttgtgcca caccctcccc cgccactcct 840  
 gaaccccgtc gaggggctct cagctcagcg ccagcctgtc ccatggacac tccagtgcc 900  
 gcaatgacat ctccaggggc agaggaactg tccagagagc aactctgaga tctaaggatg 960  
 tcacagggcc aacttgaggg ccagagcag gaagcattca gagagcagct tttaaactcag 1020  
 ggacagagcc atgctgggaa gacgcctgag ctactcggc accctgcaaa atttgatgcc 1080  
 aggacacgct ttggaggcga ttacctgtt ttgcaccta ccatcaggga caggatgacc 1140

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tggagaactt aggtggcaag ctgtgacttc tccaggtctc acgggcatgg gcactccctt 1200
gggtggcaaga gcccccttga caccgggggtg gtgggaacca tgaagacagg atggggggctg 1260
gcctctgggt ctcatgggggt ccaagttttg tgtattcttc aacctcattg acaagaactg 1320
aaaccaccaa aaaaaaaaaa aa 1342

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<210> 16
<211> 193
<212> PRT
<213> Homo sapiens

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<400> 16

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Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
1          5          10          15

```

```

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Ala Pro Pro Arg Leu
          20          25          30

```

```

Ile Cys Asp Ser Arg Val Leu Glu Arg Tyr Leu Leu Glu Ala Lys Glu
          35          40          45

```

```

Ala Glu Asn Ile Thr Thr Gly Cys Ala Glu His Cys Ser Leu Asn Glu
50          55          60

```

```

Asn Ile Thr Val Pro Asp Thr Lys Val Asn Phe Tyr Ala Trp Lys Arg
65          70          75          80

```

```

Met Glu Val Gly Gln Gln Ala Val Glu Val Trp Gln Gly Leu Ala Leu
          85          90          95

```

```

Leu Ser Glu Ala Val Leu Arg Gly Gln Ala Leu Leu Val Asn Ser Ser
          100          105          110

```

```

Gln Pro Trp Glu Pro Leu Gln Leu His Val Asp Lys Ala Val Ser Gly
          115          120          125

```

```

Leu Arg Ser Leu Thr Thr Leu Leu Arg Ala Leu Arg Ala Gln Lys Glu
          130          135          140

```

```

Ala Ile Ser Pro Pro Asp Ala Ala Ser Ala Ala Pro Leu Arg Thr Ile
145          150          155          160

```

```

Thr Ala Asp Thr Phe Arg Lys Leu Phe Arg Val Tyr Ser Asn Phe Leu

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165

170

175

Arg Gly Lys Leu Lys Leu Tyr Thr Gly Glu Ala Cys Arg Thr Gly Asp  
 180 185 190

Arg

<210> 17  
 <211> 435  
 <212> DNA  
 <213> Homo sapiens

<400> 17  
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 cgtctcctga acctgagtag agacactgct gctgagatga atgaaacagt agaagtcac 180  
 tcagaaatgt ttgacctcca ggagccgacc tgcctacaga cccgcctgga gctgtacaag 240  
 cagggcctgc ggggcagcct caccaagctc aagggcccct tgaccatgat ggccagccac 300  
 tacaagcagc actgcctcc aaccccgga acttctgtg caaccoagat tatcaccttt 360  
 gaaagtttca aagagaacct gaaggacttt ctgcttgtca tcccctttga ctgctgggag 420  
 ccagtccagg agtga 435

<210> 18  
 <211> 144  
 <212> PRT  
 <213> Homo sapiens

&lt;400&gt; 18

Met Trp Leu Gln Ser Leu Leu Leu Leu Gly Thr Val Ala Cys Ser Ile  
 1 5 10 15

Ser Ala Pro Ala Arg Ser Pro Ser Pro Ser Thr Gln Pro Trp Glu His  
 20 25 30

Val Asn Ala Ile Gln Glu Ala Arg Arg Leu Leu Asn Leu Ser Arg Asp  
 35 40 45

Thr Ala Ala Glu Met Asn Glu Thr Val Glu Val Ile Ser Glu Met Phe  
 50 55 60

Asp Leu Gln Glu Pro Thr Cys Leu Gln Thr Arg Leu Glu Leu Tyr Lys  
65 70 75 80

Gln Gly Leu Arg Gly Ser Leu Thr Lys Leu Lys Gly Pro Leu Thr Met  
85 90 95

Met Ala Ser His Tyr Lys Gln His Cys Pro Pro Thr Pro Glu Thr Ser  
100 105 110

Cys Ala Thr Gln Ile Ile Thr Phe Glu Ser Phe Lys Glu Asn Leu Lys  
115 120 125

Asp Phe Leu Leu Val Ile Pro Phe Asp Cys Trp Glu Pro Val Gln Glu  
130 135 140

<210> 19  
<211> 501  
<212> DNA  
<213> Homo sapiens

<400> 19  
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tgttactgcc aggaccata tgtaaaagaa gcagaaaacc ttaagaaata ttttaatgca 120  
ggtcattcag atgtagcgga taatggaact cttttcttag gcattttgaa gaattggaaa 180  
gaggagagtg acagaaaaat aatgcagagc caaattgtct ccttttactt caaacttttt 240  
aaaaacttta aagatgacca gagcatccaa aagagtgtgg agaccatcaa ggaagacatg 300  
aatgtcaagt ttttcaatag caacaaaaag aaacgagatg acttcgaaaa gctgactaat 360  
tattcggtaa ctgacttgaa tgtccaacgc aaagcaatac atgaactcat ccaagtgatg 420  
gctgaactgt cgccagcagc taaaacaggg aagcgaaaaa ggagtcagat gctgtttcga 480  
ggtcgaagag catcccagta a 501

<210> 20  
<211> 166  
<212> PRT  
<213> Homo sapiens

<400> 20

Met Lys Tyr Thr Ser Tyr Ile Leu Ala Phe Gln Leu Cys Ile Val Leu  
1 5 10 15

Gly Ser Leu Gly Cys Tyr Cys Gln Asp Pro Tyr Val Lys Glu Ala Glu

20	25	30
Asn Leu Lys Lys Tyr Phe Asn Ala Gly His Ser Asp Val Ala Asp Asn		
35	40	45
Gly Thr Leu Phe Leu Gly Ile Leu Lys Asn Trp Lys Glu Glu Ser Asp		
50	55	60
Arg Lys Ile Met Gln Ser Gln Ile Val Ser Phe Tyr Phe Lys Leu Phe		
65	70	75 80
Lys Asn Phe Lys Asp Asp Gln Ser Ile Gln Lys Ser Val Glu Thr Ile		
85	90	95
Lys Glu Asp Met Asn Val Lys Phe Phe Asn Ser Asn Lys Lys Lys Arg		
100	105	110
Asp Asp Phe Glu Lys Leu Thr Asn Tyr Ser Val Thr Asp Leu Asn Val		
115	120	125
Gln Arg Lys Ala Ile His Glu Leu Ile Gln Val Met Ala Glu Leu Ser		
130	135	140
Pro Ala Ala Lys Thr Gly Lys Arg Lys Arg Ser Gln Met Leu Phe Arg		
145	150	155 160
Gly Arg Arg Ala Ser Gln		
165		

<210> 21  
 <211> 1352  
 <212> DNA  
 <213> Homo sapiens

<400> 21  
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 cctgtgctgc ctggtccctg tctccctggc tgaggatccc caggagatg ctgccagaa 120  
 gacagatata tcccaccatg atcaggatca cccaaccttc aacaagatca cccccaacct 180  
 ggctgagttc gccttcagcc tataccgcca gctggcacac cagtccaaca gcaccaatat 240  
 cttctttctcc ccagttagca tcgctacagc ctttgcaatg ctctccctgg ggaccaaggc 300  
 tgacactcac gatgaaatcc tggagggcct gaatttcaac' ctcacggaga ttccggaggc 360

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tcagatccat gaaggcttcc aggaactcct ccgtaccctc aaccagccag acagccagct 420
ccagctgacc accggcaatg gcctgttccct cagcgagggc ctgaagctag tggataagtt 480
tttgagggat gttaaaaagt tgtaccactc agaagccttc actgtcaact tcggggacac 540
cgaagaggcc aagaaacaga tcaacgatta cgtggagaag ggtactcaag ggaaaattgt 600
ggatttggtc aaggagcttg acagagacac agtttttgct ctggtgaatt acatcttctt 660
taaaggcaaa tgggagagac cctttgaagt caaggacacc gaggaagagg acttccacgt 720
ggaccaggtg accaccgtga aggtgcctat gatgaagcgt ttaggcattgt ttaacatcca 780
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catcttcttc ctgcctgatg aggggaaact acagcacctg gaaaatgaac tcacccacga 900
tatcatcacc aagttcctgg aaaatgaaga cagaaggtct gccagcttac atttacccaa 960
actgtccatt actggaacct atgatctgaa gagcgtcctg ggtcaactgg gcatcactaa 1020
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caaggccgtg cataaggctg tgctgaccat cgacgagaaa gggactgaag ctgctggggc 1140
catgttttta gaggccatac ccatgtctat ccccccgag gtcaagttca acaaaccctt 1200
tgtcttctta atgattgaac aaaataccaa gtctcccctc ttcattgggaa aagtggtgaa 1260
tcccacccaa aaataactgc ctctcgctcc tcaaccctc ccctccatcc ctggccccct 1320
ccctggatga cattaaagaa gggttgagct gg 1352

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<210> 22  
 <211> 418  
 <212> PRT  
 <213> Homo sapiens

<400> 22

Met Pro Ser Ser Val Ser Trp Gly Ile Leu Leu Leu Ala Gly Leu Cys  
 1 5 10 15

Cys Leu Val Pro Val Ser Leu Ala Glu Asp Pro Gln Gly Asp Ala Ala  
 20 25 30

Gln Lys Thr Asp Thr Ser His His Asp Gln Asp His Pro Thr Phe Asn  
 35 40 45

Lys Ile Thr Pro Asn Leu Ala Glu Phe Ala Phe Ser Leu Tyr Arg Gln  
 50 55 60

Leu Ala His Gln Ser Asn Ser Thr Asn Ile Phe Phe Ser Pro Val Ser  
65 70 75 80

Ile Ala Thr Ala Phe Ala Met Leu Ser Leu Gly Thr Lys Ala Asp Thr  
85 90 95

His Asp Glu Ile Leu Glu Gly Leu Asn Phe Asn Leu Thr Glu Ile Pro  
100 105 110

Glu Ala Gln Ile His Glu Gly Phe Gln Glu Leu Leu Arg Thr Leu Asn  
115 120 125

Gln Pro Asp Ser Gln Leu Gln Leu Thr Thr Gly Asn Gly Leu Phe Leu  
130 135 140

Ser Glu Gly Leu Lys Leu Val Asp Lys Phe Leu Glu Asp Val Lys Lys  
145 150 155 160

Leu Tyr His Ser Glu Ala Phe Thr Val Asn Phe Gly Asp Thr Glu Glu  
165 170 175

Ala Lys Lys Gln Ile Asn Asp Tyr Val Glu Lys Gly Thr Gln Gly Lys  
180 185 190

Ile Val Asp Leu Val Lys Glu Leu Asp Arg Asp Thr Val Phe Ala Leu  
195 200 205

Val Asn Tyr Ile Phe Phe Lys Gly Lys Trp Glu Arg Pro Phe Glu Val  
210 215 220

Lys Asp Thr Glu Glu Glu Asp Phe His Val Asp Gln Val Thr Thr Val  
225 230 235 240

Lys Val Pro Met Met Lys Arg Leu Gly Met Phe Asn Ile Gln His Cys  
245 250 255

Lys Lys Leu Ser Ser Trp Val Leu Leu Met Lys Tyr Leu Gly Asn Ala  
260 265 270

Thr Ala Ile Phe Phe Leu Pro Asp Glu Gly Lys Leu Gln His Leu Glu  
275 280 285

Asn Glu Leu Thr His Asp Ile Ile Thr Lys Phe Leu Glu Asn Glu Asp  
 290 295 300

Arg Arg Ser Ala Ser Leu His Leu Pro Lys Leu Ser Ile Thr Gly Thr  
 305 310 315 320

Tyr Asp Leu Lys Ser Val Leu Gly Gln Leu Gly Ile Thr Lys Val Phe  
 325 330 335

Ser Asn Gly Ala Asp Leu Ser Gly Val Thr Glu Glu Ala Pro Leu Lys  
 340 345 350

Leu Ser Lys Ala Val His Lys Ala Val Leu Thr Ile Asp Glu Lys Gly  
 355 360 365

Thr Glu Ala Ala Gly Ala Met Phe Leu Glu Ala Ile Pro Met Ser Ile  
 370 375 380

Pro Pro Glu Val Lys Phe Asn Lys Pro Phe Val Phe Leu Met Ile Glu  
 385 390 395 400

Gln Asn Thr Lys Ser Pro Leu Phe Met Gly Lys Val Val Asn Pro Thr  
 405 410 415

Gln Lys

<210> 23  
 <211> 2004  
 <212> DNA  
 <213> Homo sapiens

<400> 23  
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 ggatggagtt ttcaagtcct tccagagagg aatgtcccaa gcctttgagt agggtaagca 180  
 tcatggctgg cagcctcaca gggttgcttc tacttcaggc agtgcgtgg gcatcaggtg 240  
 cccgcccctg catocctaaa agcttcggct acagctcggg ggtgtgtgtc tgcaatgcca 300  
 catactgtga ctctttgac ccccgacct ttctgcctc tggtaacctc agccgctatg 360  
 agagtacacg cagtgggcca cggatggagc tgagtatggg gccatccag gctaatacaca 420  
 cgggcacagg cctgctactg acctgcagc cagaacagaa gttccagaaa gtgaagggat 480

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ttggagggggc catgacagat gctgctgctc tcaacatcct tgccctgtca cccctgccc      540
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taccatggc cagctgtgac ttctccatcc gcacctacac ctatgcagac accctgatg      660
atttcagtt gcacaacttc agcctcccag aggaagatac caagctcaag ataccctga      720
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caccacttg gctcaagacc aatggagcgg tgaatgggaa ggggtcactc aagggacagc      840
ccggagacat ctaccaccag acctgggcca gatactttgt gaagttcctg gatgcctatg      900
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aagccaccct aggggagaca caccgcctgt tccccaacac catgctcttt gcctcagagg     1260
cctgtgtggg ctccaagttc tgggagcaga gtgtgaggct aggtcctgg gatcgaggga     1320
tgcagtacag ccacagcacc atcagaacc tcctgtacca tgtggtcggc tggaccgact     1380
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ggggcaatgg tttgggtgac tcactttccc ctctaggtgg tgcccagggc tggaggcccc     1920
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<210> 24  
<211> 536  
<212> PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 24

Met Glu Phe Ser Ser Pro Ser Arg Glu Glu Cys Pro Lys Pro Leu Ser  
 1 5 10 15

Arg Val Ser Ile Met Ala Gly Ser Leu Thr Gly Leu Leu Leu Leu Gln  
 20 25 30

Ala Val Ser Trp Ala Ser Gly Ala Arg Pro Cys Ile Pro Lys Ser Phe  
 35 40 45

Gly Tyr Ser Ser Val Val Cys Val Cys Asn Ala Thr Tyr Cys Asp Ser  
 50 55 60

Phe Asp Pro Pro Thr Phe Pro Ala Leu Gly Thr Phe Ser Arg Tyr Glu  
 65 70 75 80

Ser Thr Arg Ser Gly Arg Arg Met Glu Leu Ser Met Gly Pro Ile Gln  
 85 90 95

Ala Asn His Thr Gly Thr Gly Leu Leu Leu Thr Leu Gln Pro Glu Gln  
 100 105 110

Lys Phe Gln Lys Val Lys Gly Phe Gly Gly Ala Met Thr Asp Ala Ala  
 115 120 125

Ala Leu Asn Ile Leu Ala Leu Ser Pro Pro Ala Gln Asn Leu Leu Leu  
 130 135 140

Lys Ser Tyr Phe Ser Glu Glu Gly Ile Gly Tyr Asn Ile Ile Arg Val  
 145 150 155 160

Pro Met Ala Ser Cys Asp Phe Ser Ile Arg Thr Tyr Thr Tyr Ala Asp  
 165 170 175

Thr Pro Asp Asp Phe Gln Leu His Asn Phe Ser Leu Pro Glu Glu Asp  
 180 185 190

Thr Lys Leu Lys Ile Pro Leu Ile His Arg Ala Leu Gln Leu Ala Gln  
 195 200 205

Arg Pro Val Ser Leu Leu Ala Ser Pro Trp Thr Ser Pro Thr Trp Leu



[illegible]

Thr Phe Tyr Lys Gln Pro Met Phe Tyr His Leu Gly His Phe Ser Lys  
 450 455 460

Phe Ile Pro Glu Gly Ser Gln Arg Val Gly Leu Val Ala Ser Gln Lys  
 465 470 475 480

Asn Asp Leu Asp Ala Val Ala Leu Met His Pro Asp Gly Ser Ala Val  
 485 490 495

Val Val Val Leu Asn Arg Ser Ser Lys Asp Val Pro Leu Thr Ile Lys  
 500 505 510

Asp Pro Ala Val Gly Phe Leu Glu Thr Ile Ser Pro Gly Tyr Ser Ile  
 515 520 525

His Thr Tyr Leu Trp His Arg Gln  
 530 535

<210> 25  
 <211> 1726  
 <212> DNA  
 <213> Homo sapiens

<400> 25  
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 tgcagagatg aaaaaacgca gatgatatac cagcaacatc agtcatggct gcgccctgtg 180  
 ctcaagaagca accgggtgga atattgctgg tgcaacagtg gcagggcaca gtgccactca 240  
 gtgcctgtca aaagttgcag cgagccaagg tgtttcaacg ggggcacctg ccagcaggcc 300  
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 acagcggaga gtggcgccga gtgcaccaac tggaacagca gcgcgttggc ccagaagccc 480  
 tacagcgggc ggaggccaga cgccatcagg ctgggcctgg ggaaccacaa ctactgcaga 540  
 aaccagatc gagactcaaa gccctgggtg tacgtcttta aggcggggaa gtacagctca 600  
 gagttctgca gcacccctgc ctgctctgag ggaaacagtg actgctactt tgggaatggg 660  
 tcagcctacc gtggcacgca cagcctcacc gagtcgggtg cctcctgcct ccggtggaat 720  
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ctgggcaaac ataattactg ccggaatcct gatgggggatg ccaagccctg gtgccacgtg 840  
 ctgaagaacc gcaggctgac gtgggagtag tgtgatgtgc cctcctgctc cacctgcggc 900  
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Ile Tyr Gln Gln His Gln Ser Trp Leu Arg Pro Val Leu Arg Ser Asn  
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Arg Val Glu Tyr Cys Trp Cys Asn Ser Gly Arg Ala Gln Cys His Ser  
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Val Pro Val Lys Ser Cys Ser Glu Pro Arg Cys Phe Asn Gly Gly Thr  
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Cys Gln Gln Ala Leu Tyr Phe Ser Asp Phe Val Cys Gln Cys Pro Glu  
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Gly Phe Ala Gly Lys Cys Cys Glu Ile Asp Thr Arg Ala Thr Cys Tyr  
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Glu Asp Gln Gly Ile Ser Tyr Arg Gly Thr Trp Ser Thr Ala Glu Ser  
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Gly Ala Glu Cys Thr Asn Trp Asn Ser Ser Ala Leu Ala Gln Lys Pro  
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Tyr Ser Gly Arg Arg Pro Asp Ala Ile Arg Leu Gly Leu Gly Asn His  
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Asn Tyr Cys Arg Asn Pro Asp Arg Asp Ser Lys Pro Trp Cys Tyr Val  
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Phe Lys Ala Gly Lys Tyr Ser Ser Glu Phe Cys Ser Thr Pro Ala Cys  
195 200 205

Ser Glu Gly Asn Ser Asp Cys Tyr Phe Gly Asn Gly Ser Ala Tyr Arg  
210 215 220

Gly Thr His Ser Leu Thr Glu Ser Gly Ala Ser Cys Leu Pro Trp Asn  
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Ser Met Ile Leu Ile Gly Lys Val Tyr Thr Ala Gln Asn Pro Ser Ala  
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Gln Ala Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Gly  
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Asp Ala Lys Pro Trp Cys His Val Leu Lys Asn Arg Arg Leu Thr Trp  
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Glu Tyr Cys Asp Val Pro Ser Cys Ser Thr Cys Gly Leu Arg Gln Tyr

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Leu Ser Ala Ala His Cys Phe Gln Glu Arg Phe Pro Pro His His Leu		
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Thr Val Ile Leu Gly Arg Thr Tyr Arg Val Val Pro Gly Glu Glu Glu		
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Gln Lys Phe Glu Val Glu Lys Tyr Ile Val His Lys Glu Phe Asp Asp		
385	390	395 400
Asp Thr Tyr Asp Asn Asp Ile Ala Leu Leu Gln Leu Lys Ser Asp Ser		
	405	410 415
Ser Arg Cys Ala Gln Glu Ser Ser Val Val Arg Thr Val Cys Leu Pro		
	420	425 430
Pro Ala Asp Leu Gln Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser Gly		
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Tyr Gly Lys His Glu Ala Leu Ser Pro Phe Tyr Ser Glu Arg Leu Lys		
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Glu Ala His Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr Ser Gln His		
465	470	475 480
Leu Leu Asn Arg Thr Val Thr Asp Asn Met Leu Cys Ala Gly Asp Thr		
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Arg Ser Gly Gly Pro Gln Ala Asn Leu His Asp Ala Cys Gln Gly Asp		
	500	505 510
Ser Gly Gly Pro Leu Val Cys Leu Asn Asp Gly Arg Met Thr Leu Val		
	515	520 525

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Val Tyr Thr Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg Asp Asn Met  
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Arg Pro

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 <212> PRT  
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<400> 28

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Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu	35	40	45
Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr	50	55	60
Phe Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys Gln Leu Gln	65	70	75
Cys Leu Glu Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala	85	90	95
Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile	100	105	110
Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys	115	120	125
Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp	130	135	140
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&lt;210&gt; 30

&lt;211&gt; 2351

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 30

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Cys Phe Ser Ala Thr Arg Arg Tyr Tyr Leu Gly Ala Val Glu Leu Ser
          20           25           30

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Trp Asp Tyr Met Gln Ser Asp Leu Gly Glu Leu Pro Val Asp Ala Arg
          35           40           45

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Phe Pro Pro Arg Val Pro Lys Ser Phe Pro Phe Asn Thr Ser Val Val
          50           55           60

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Tyr Lys Lys Thr Leu Phe Val Glu Phe Thr Asp His Leu Phe Asn Ile
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Ala Lys Pro Arg Pro Pro Trp Met Gly Leu Leu Gly Pro Thr Ile Gln
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Ala Glu Val Tyr Asp Thr Val Val Ile Thr Leu Lys Asn Met Ala Ser  
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His Pro Val Ser Leu His Ala Val Gly Val Ser Tyr Trp Lys Ala Ser  
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Glu Gly Ala Glu Tyr Asp Asp Gln Thr Ser Gln Arg Glu Lys Glu Asp  
 130 135 140

Asp Lys Val Phe Pro Gly Gly Ser His Thr Tyr Val Trp Gln Val Leu  
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Lys Glu Asn Gly Pro Met Ala Ser Asp Pro Leu Cys Leu Thr Tyr Ser  
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Tyr Leu Ser His Val Asp Leu Val Lys Asp Leu Asn Ser Gly Leu Ile  
 180 185 190

Gly Ala Leu Leu Val Cys Arg Glu Gly Ser Leu Ala Lys Glu Lys Thr  
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Gln Thr Leu His Lys Phe Ile Leu Leu Phe Ala Val Phe Asp Glu Gly  
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Lys Ser Trp His Ser Glu Thr Lys Asn Ser Leu Met Gln Asp Arg Asp  
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Tyr Trp His Val Ile Gly Met Gly Thr Thr Pro Glu Val His Ser Ile  
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Leu Ile Ile Phe Lys Asn Gln Ala Ser Arg Pro Tyr Asn Ile Tyr Pro  
 485 490 495

His Gly Ile Thr Asp Val Arg Pro Leu Tyr Ser Arg Arg Leu Pro Lys  
 500 505 510

Gly Val Lys His Leu Lys Asp Phe Pro Ile Leu Pro Gly Glu Ile Phe  
 515 520 525

Lys Tyr Lys Trp Thr Val Thr Val Glu Asp Gly Pro Thr Lys Ser Asp  
 530 535 540

Pro Arg Cys Leu Thr Arg Tyr Tyr Ser Ser Phe Val Asn Met Glu Arg

545	550	555	560
Asp Leu Ala Ser Gly Leu Ile Gly Pro Leu Leu Ile Cys Tyr Lys Glu			
	565	570	575
Ser Val Asp Gln Arg Gly Asn Gln Ile Met Ser Asp Lys Arg Asn Val			
	580	585	590
Ile Leu Phe Ser Val Phe Asp Glu Asn Arg Ser Trp Tyr Leu Thr Glu			
	595	600	605
Asn Ile Gln Arg Phe Leu Pro Asn Pro Ala Gly Val Gln Leu Glu Asp			
	610	615	620
Pro Glu Phe Gln Ala Ser Asn Ile Met His Ser Ile Asn Gly Tyr Val			
	625	630	635
Phe Asp Ser Leu Gln Leu Ser Val Cys Leu His Glu Val Ala Tyr Trp			
	645	650	655
Tyr Ile Leu Ser Ile Gly Ala Gln Thr Asp Phe Leu Ser Val Phe Phe			
	660	665	670
Ser Gly Tyr Thr Phe Lys His Lys Met Val Tyr Glu Asp Thr Leu Thr			
	675	680	685
Leu Phe Pro Phe Ser Gly Glu Thr Val Phe Met Ser Met Glu Asn Pro			
	690	695	700
Gly Leu Trp Ile Leu Gly Cys His Asn Ser Asp Phe Arg Asn Arg Gly			
	705	710	715
Met Thr Ala Leu Leu Lys Val Ser Ser Cys Asp Lys Asn Thr Gly Asp			
	725	730	735
Tyr Tyr Glu Asp Ser Tyr Glu Asp Ile Ser Ala Tyr Leu Leu Ser Lys			
	740	745	750
Asn Asn Ala Ile Glu Pro Arg Ser Phe Ser Gln Asn Ser Arg His Arg			
	755	760	765
Ser Thr Arg Gln Lys Gln Phe Asn Ala Thr Thr Ile Pro Glu Asn Asp			
	770	775	780

Ile Glu Lys Thr Asp Pro Trp Phe Ala His Arg Thr Pro Met Pro Lys  
 785 790 795 800

Ile Gln Asn Val Ser Ser Ser Asp Leu Leu Met Leu Leu Arg Gln Ser  
 805 810 815

Pro Thr Pro His Gly Leu Ser Leu Ser Asp Leu Gln Glu Ala Lys Tyr  
 820 825 830

Glu Thr Phe Ser Asp Asp Pro Ser Pro Gly Ala Ile Asp Ser Asn Asn  
 835 840 845

Ser Leu Ser Glu Met Thr His Phe Arg Pro Gln Leu His His Ser Gly  
 850 855 860

Asp Met Val Phe Thr Pro Glu Ser Gly Leu Gln Leu Arg Leu Asn Glu  
 865 870 875 880

Lys Leu Gly Thr Thr Ala Ala Thr Glu Leu Lys Lys Leu Asp Phe Lys  
 885 890 895

Val Ser Ser Thr Ser Asn Asn Leu Ile Ser Thr Ile Pro Ser Asp Asn  
 900 905 910

Leu Ala Ala Gly Thr Asp Asn Thr Ser Ser Leu Gly Pro Pro Ser Met  
 915 920 925

Pro Val His Tyr Asp Ser Gln Leu Asp Thr Thr Leu Phe Gly Lys Lys  
 930 935 940

Ser Ser Pro Leu Thr Glu Ser Gly Gly Pro Leu Ser Leu Ser Glu Glu  
 945 950 955 960

Asn Asn Asp Ser Lys Leu Leu Glu Ser Gly Leu Met Asn Ser Gln Glu  
 965 970 975

Ser Ser Trp Gly Lys Asn Val Ser Ser Thr Glu Ser Gly Arg Leu Phe  
 980 985 990

Lys Gly Lys Arg Ala His Gly Pro Ala Leu Leu Thr Lys Asp Asn Ala  
 995 1000 1005



Leu Phe	Lys Val	Ser Ile	Ser	Leu Leu	Lys Thr	Asn	Lys Thr	Ser
1010			1015			1020		
Asn Asn	Ser Ala	Thr Asn	Arg	Lys Thr	His Ile	Asp	Gly Pro	Ser
1025			1030			1035		
Leu Leu	Ile Glu	Asn Ser	Pro	Ser Val	Trp Gln	Asn	Ile Leu	Glu
1040			1045			1050		
Ser Asp	Thr Glu	Phe Lys	Lys	Val Thr	Pro Leu	Ile	His Asp	Arg
1055			1060			1065		
Met Leu	Met Asp	Lys Asn	Ala	Thr Ala	Leu Arg	Leu	Asn His	Met
1070			1075			1080		
Ser Asn	Lys Thr	Thr Ser	Ser	Lys Asn	Met Glu	Met	Val Gln	Gln
1085			1090			1095		
Lys Lys	Glu Gly	Pro Ile	Pro	Pro Asp	Ala Gln	Asn	Pro Asp	Met
1100			1105			1110		
Ser Phe	Phe Lys	Met Leu	Phe	Leu Pro	Glu Ser	Ala	Arg Trp	Ile
1115			1120			1125		
Gln Arg	Thr His	Gly Lys	Asn	Ser Leu	Asn Ser	Gly	Gln Gly	Pro
1130			1135			1140		
Ser Pro	Lys Gln	Leu Val	Ser	Leu Gly	Pro Glu	Lys	Ser Val	Glu
1145			1150			1155		
Gly Gln	Asn Phe	Leu Ser	Glu	Lys Asn	Lys Val	Val	Val Gly	Lys
1160			1165			1170		
Gly Glu	Phe Thr	Lys Asp	Val	Gly Leu	Lys Glu	Met	Val Phe	Pro
1175			1180			1185		
Ser Ser	Arg Asn	Leu Phe	Leu	Thr Asn	Leu Asp	Asn	Leu His	Glu
1190			1195			1200		
Asn Asn	Thr His	Asn Gln	Glu	Lys Lys	Ile Gln	Glu	Glu Ile	Glu
1205			1210			1215		

Lys	Lys	Glu	Thr	Leu	Ile	Gln	Glu	Asn	Val	Val	Leu	Pro	Gln	Ile
1220						1225					1230			
His	Thr	Val	Thr	Gly	Thr	Lys	Asn	Phe	Met	Lys	Asn	Leu	Phe	Leu
1235						1240					1245			
Leu	Ser	Thr	Arg	Gln	Asn	Val	Glu	Gly	Ser	Tyr	Asp	Gly	Ala	Tyr
1250						1255					1260			
Ala	Pro	Val	Leu	Gln	Asp	Phe	Arg	Ser	Leu	Asn	Asp	Ser	Thr	Asn
1265						1270					1275			
Arg	Thr	Lys	Lys	His	Thr	Ala	His	Phe	Ser	Lys	Lys	Gly	Glu	Glu
1280						1285					1290			
Glu	Asn	Leu	Glu	Gly	Leu	Gly	Asn	Gln	Thr	Lys	Gln	Ile	Val	Glu
1295						1300					1305			
Lys	Tyr	Ala	Cys	Thr	Thr	Arg	Ile	Ser	Pro	Asn	Thr	Ser	Gln	Gln
1310						1315					1320			
Asn	Phe	Val	Thr	Gln	Arg	Ser	Lys	Arg	Ala	Leu	Lys	Gln	Phe	Arg
1325						1330					1335			
Leu	Pro	Leu	Glu	Glu	Thr	Glu	Leu	Glu	Lys	Arg	Ile	Ile	Val	Asp
1340						1345					1350			
Asp	Thr	Ser	Thr	Gln	Trp	Ser	Lys	Asn	Met	Lys	His	Leu	Thr	Pro
1355						1360					1365			
Ser	Thr	Leu	Thr	Gln	Ile	Asp	Tyr	Asn	Glu	Lys	Glu	Lys	Gly	Ala
1370						1375					1380			
Ile	Thr	Gln	Ser	Pro	Leu	Ser	Asp	Cys	Leu	Thr	Arg	Ser	His	Ser
1385						1390					1395			
Ile	Pro	Gln	Ala	Asn	Arg	Ser	Pro	Leu	Pro	Ile	Ala	Lys	Val	Ser
1400						1405					1410			
Ser	Phe	Pro	Ser	Ile	Arg	Pro	Ile	Tyr	Leu	Thr	Arg	Val	Leu	Phe
1415						1420					1425			
Gln	Asp	Asn	Ser	Ser	His	Leu	Pro	Ala	Ala	Ser	Tyr	Arg	Lys	Lys

1430		1435		1440
Asp Ser Gly Val Gln Glu Ser Ser His Phe Leu Gln Gly Ala Lys	1445	1450		1455
Lys Asn Asn Leu Ser Leu Ala Ile Leu Thr Leu Glu Met Thr Gly	1460	1465		1470
Asp Gln Arg Glu Val Gly Ser Leu Gly Thr Ser Ala Thr Asn Ser	1475	1480		1485
Val Thr Tyr Lys Lys Val Glu Asn Thr Val Leu Pro Lys Pro Asp	1490	1495		1500
Leu Pro Lys Thr Ser Gly Lys Val Glu Leu Leu Pro Lys Val His	1505	1510		1515
Ile Tyr Gln Lys Asp Leu Phe Pro Thr Glu Thr Ser Asn Gly Ser	1520	1525		1530
Pro Gly His Leu Asp Leu Val Glu Gly Ser Leu Leu Gln Gly Thr	1535	1540		1545
Glu Gly Ala Ile Lys Trp Asn Glu Ala Asn Arg Pro Gly Lys Val	1550	1555		1560
Pro Phe Leu Arg Val Ala Thr Glu Ser Ser Ala Lys Thr Pro Ser	1565	1570		1575
Lys Leu Leu Asp Pro Leu Ala Trp Asp Asn His Tyr Gly Thr Gln	1580	1585		1590
Ile Pro Lys Glu Glu Trp Lys Ser Gln Glu Lys Ser Pro Glu Lys	1595	1600		1605
Thr Ala Phe Lys Lys Lys Asp Thr Ile Leu Ser Leu Asn Ala Cys	1610	1615		1620
Glu Ser Asn His Ala Ile Ala Ala Ile Asn Glu Gly Gln Asn Lys	1625	1630		1635
Pro Glu Ile Glu Val Thr Trp Ala Lys Gln Gly Arg Thr Glu Arg	1640	1645		1650

Leu Cys Ser Gln Asn Pro Pro Val Leu Lys Arg His Gln Arg Glu	1655	1660	1665
Ile Thr Arg Thr Thr Leu Gln Ser Asp Gln Glu Glu Ile Asp Tyr	1670	1675	1680
Asp Asp Thr Ile Ser Val Glu Met Lys Lys Glu Asp Phe Asp Ile	1685	1690	1695
Tyr Asp Glu Asp Glu Asn Gln Ser Pro Arg Ser Phe Gln Lys Lys	1700	1705	1710
Thr Arg His Tyr Phe Ile Ala Ala Val Glu Arg Leu Trp Asp Tyr	1715	1720	1725
Gly Met Ser Ser Ser Pro His Val Leu Arg Asn Arg Ala Gln Ser	1730	1735	1740
Gly Ser Val Pro Gln Phe Lys Lys Val Val Phe Gln Glu Phe Thr	1745	1750	1755
Asp Gly Ser Phe Thr Gln Pro Leu Tyr Arg Gly Glu Leu Asn Glu	1760	1765	1770
His Leu Gly Leu Leu Gly Pro Tyr Ile Arg Ala Glu Val Glu Asp	1775	1780	1785
Asn Ile Met Val Thr Phe Arg Asn Gln Ala Ser Arg Pro Tyr Ser	1790	1795	1800
Phe Tyr Ser Ser Leu Ile Ser Tyr Glu Glu Asp Gln Arg Gln Gly	1805	1810	1815
Ala Glu Pro Arg Lys Asn Phe Val Lys Pro Asn Glu Thr Lys Thr	1820	1825	1830
Tyr Phe Trp Lys Val Gln His His Met Ala Pro Thr Lys Asp Glu	1835	1840	1845
Phe Asp Cys Lys Ala Trp Ala Tyr Phe Ser Asp Val Asp Leu Glu	1850	1855	1860

Lys	Asp	Val	His	Ser	Gly	Leu	Ile	Gly	Pro	Leu	Leu	Val	Cys	His
1865						1870					1875			
Thr	Asn	Thr	Leu	Asn	Pro	Ala	His	Gly	Arg	Gln	Val	Thr	Val	Gln
1880						1885					1890			
Glu	Phe	Ala	Leu	Phe	Phe	Thr	Ile	Phe	Asp	Glu	Thr	Lys	Ser	Trp
1895						1900					1905			
Tyr	Phe	Thr	Glu	Asn	Met	Glu	Arg	Asn	Cys	Arg	Ala	Pro	Cys	Asn
1910						1915					1920			
Ile	Gln	Met	Glu	Asp	Pro	Thr	Phe	Lys	Glu	Asn	Tyr	Arg	Phe	His
1925						1930					1935			
Ala	Ile	Asn	Gly	Tyr	Ile	Met	Asp	Thr	Leu	Pro	Gly	Leu	Val	Met
1940						1945					1950			
Ala	Gln	Asp	Gln	Arg	Ile	Arg	Trp	Tyr	Leu	Leu	Ser	Met	Gly	Ser
1955						1960					1965			
Asn	Glu	Asn	Ile	His	Ser	Ile	His	Phe	Ser	Gly	His	Val	Phe	Thr
1970						1975					1980			
Val	Arg	Lys	Lys	Glu	Glu	Tyr	Lys	Met	Ala	Leu	Tyr	Asn	Leu	Tyr
1985						1990					1995			
Pro	Gly	Val	Phe	Glu	Thr	Val	Glu	Met	Leu	Pro	Ser	Lys	Ala	Gly
2000						2005					2010			
Ile	Trp	Arg	Val	Glu	Cys	Leu	Ile	Gly	Glu	His	Leu	His	Ala	Gly
2015						2020					2025			
Met	Ser	Thr	Leu	Phe	Leu	Val	Tyr	Ser	Asn	Lys	Cys	Gln	Thr	Pro
2030						2035					2040			
Leu	Gly	Met	Ala	Ser	Gly	His	Ile	Arg	Asp	Phe	Gln	Ile	Thr	Ala
2045						2050					2055			
Ser	Gly	Gln	Tyr	Gly	Gln	Trp	Ala	Pro	Lys	Leu	Ala	Arg	Leu	His
2060						2065					2070			

Tyr	Ser	Gly	Ser	Ile	Asn	Ala	Trp	Ser	Thr	Lys	Glu	Pro	Phe	Ser
2075						2080					2085			
Trp	Ile	Lys	Val	Asp	Leu	Leu	Ala	Pro	Met	Ile	Ile	His	Gly	Ile
2090						2095					2100			
Lys	Thr	Gln	Gly	Ala	Arg	Gln	Lys	Phe	Ser	Ser	Leu	Tyr	Ile	Ser
2105						2110					2115			
Gln	Phe	Ile	Ile	Met	Tyr	Ser	Leu	Asp	Gly	Lys	Lys	Trp	Gln	Thr
2120						2125					2130			
Tyr	Arg	Gly	Asn	Ser	Thr	Gly	Thr	Leu	Met	Val	Phe	Phe	Gly	Asn
2135						2140					2145			
Val	Asp	Ser	Ser	Gly	Ile	Lys	His	Asn	Ile	Phe	Asn	Pro	Pro	Ile
2150						2155					2160			
Ile	Ala	Arg	Tyr	Ile	Arg	Leu	His	Pro	Thr	His	Tyr	Ser	Ile	Arg
2165						2170					2175			
Ser	Thr	Leu	Arg	Met	Glu	Leu	Met	Gly	Cys	Asp	Leu	Asn	Ser	Cys
2180						2185					2190			
Ser	Met	Pro	Leu	Gly	Met	Glu	Ser	Lys	Ala	Ile	Ser	Asp	Ala	Gln
2195						2200					2205			
Ile	Thr	Ala	Ser	Ser	Tyr	Phe	Thr	Asn	Met	Phe	Ala	Thr	Trp	Ser
2210						2215					2220			
Pro	Ser	Lys	Ala	Arg	Leu	His	Leu	Gln	Gly	Arg	Ser	Asn	Ala	Trp
2225						2230					2235			
Arg	Pro	Gln	Val	Asn	Asn	Pro	Lys	Glu	Trp	Leu	Gln	Val	Asp	Phe
2240						2245					2250			
Gln	Lys	Thr	Met	Lys	Val	Thr	Gly	Val	Thr	Thr	Gln	Gly	Val	Lys
2255						2260					2265			
Ser	Leu	Leu	Thr	Ser	Met	Tyr	Val	Lys	Glu	Phe	Leu	Ile	Ser	Ser
2270						2275					2280			
Ser	Gln	Asp	Gly	His	Gln	Trp	Thr	Leu	Phe	Phe	Gln	Asn	Gly	Lys

2285		2290		2295
Val Lys	Val Phe Gln Gly Asn	Gln Asp Ser Phe Thr	Pro Val Val	
2300		2305		2310
Asn Ser	Leu Asp Pro Pro Leu	Leu Thr Arg Tyr Leu	Arg Ile His	
2315		2320		2325
Pro Gln	Ser Trp Val His Gln	Ile Ala Leu Arg Met	Glu Val Leu	
2330		2335		2340
Gly Cys	Glu Ala Gln Asp Leu	Tyr		
2345		2350		

<210> 31  
 <211> 1471  
 <212> DNA  
 <213> Homo sapiens

<400> 31  
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 cagcccttgc ccgcccaggt ggcatttaca ccctaagccc cggagc'ccgg gagcacatgc 120  
 cggctcagag aatactatga ccagacagct cagatgtgct gcagcaa'atg ctgcgcgggc 180  
 caacatgcaa aagtcttctg taccaagacc tcggacaccg tgtgtgactc ctgtgaggac 240  
 agcacatata ccagctctg gaactggggt cccgagtgtc tgagctgtgg ctcccgtgt 300  
 agctctgacc aggtggaaac tcaagcctgc actcgggaac agaaccgc'at ctgcacctgc 360  
 aggcccggt ggtactgccc gctgagcaag caggaggggt gccggctgtg cgcgcgcgtg 420  
 cgcaagtgcc gcccgggctt cggcgtggcc agaccaggaa ctgaaacatc agacgtgggtg 480  
 tgcaagccct gtgccccggg gacgttctcc aacacgactt catccacgga tatttgcagg 540  
 ccccaccaga tctgtaacgt ggtggccatc cctgggaatg caagcatgga tgcagtctgc 600  
 acgtccacgt cccccaccg gagtatggcc ccagggg'cag tacacttacc ccagccagtg 660  
 tocacacgat cccaacacac gcagccaact ccagaaccca g'cactgctcc aagcacctcc 720  
 ttctgtctcc caatgggccc cagcccccca gctgaaggga g'cactggcga cttoctctt 780  
 ccagttggac tgattgtggg tgtgacagcc ttgggtctac taataatagg agtgg'tgaac 840  
 tgtgtcatca tgacc'caggt gaaaaagaag cccttgtgcc tgcagagaga agccaagg'tg 900  
 cctcaattgc ctgccgataa ggccccgggt acacaggggc ccgagcagca gcacctgctg 960

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atcacagcgc cgagctccag cagcagctcc ctggagagct cggccagtgc gttggacaga 1020
agggcgccca ctcggaacca gccacaggca ccaggcgtgg aggccagtgg ggccggggag 1080
ggccggggcca gcaccgggag ctcagattct tcccctggtg gccatgggac ccagggtcaat 1140
gtcacctgca tcgtgaacgt ctgtagcagc tctgaccaca gctcacagtg ctctcccaa 1200
gccagctcca caatgggaga cacagattcc agcccctcgg agtccccgaa ggacgagcag 1260
gtcccccttct ccaaggagga atgtgccttt cggtcacagc tggagacgcc agagaccctg 1320
ctgggggagca ccgaagagaa gccctgccc cttggagtgc ctgatgctgg gatgaagccc 1380
agttaaccag gccggtgtgg gctgtgtcgt agccaagggt ggctgagccc tggcaggatg 1440
accctgcgaa ggggccctgg tccttcagg c 1471

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<210> 32  
 <211> 461  
 <212> PRT  
 <213> Homo sapiens

<400> 32

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Met Ala Pro Val Ala Val Trp Ala Ala Leu Ala Val Gly Leu Glu Leu
1           5           10           15

```

```

Trp Ala Ala Ala His Ala Leu Pro Ala Gln Val Ala Phe Thr Pro Tyr
           20           25           30

```

```

Ala Pro Glu Pro Gly Ser Thr Cys Arg Leu Arg Glu Tyr Tyr Asp Gln
           35           40           45

```

```

Thr Ala Gln Met Cys Cys Ser Lys Cys Ser Pro Gly Gln His Ala Lys
           50           55           60

```

```

Val Phe Cys Thr Lys Thr Ser Asp Thr Val Cys Asp Ser Cys Glu Asp
           65           70           75           80

```

```

Ser Thr Tyr Thr Gln Leu Trp Asn Trp Val Pro Glu Cys Leu Ser Cys
           85           90           95

```

```

Gly Ser Arg Cys Ser Ser Asp Gln Val Glu Thr Gln Ala Cys Thr Arg
           100          105          110

```

```

Glu Gln Asn Arg Ile Cys Thr Cys Arg Pro Gly Trp Tyr Cys Ala Leu
           115          120          125

```



Ser Lys Gln Glu Gly Cys Arg Leu Cys Ala Pro Leu Arg Lys Cys Arg  
 130 135 140

Pro Gly Phe Gly Val Ala Arg Pro Gly Thr Glu Thr Ser Asp Val Val  
 145 150 155 160

Cys Lys Pro Cys Ala Pro Gly Thr Phe Ser Asn Thr Thr Ser Ser Thr  
 165 170 175

Asp Ile Cys Arg Pro His Gln Ile Cys Asn Val Val Ala Ile Pro Gly  
 180 185 190

Asn Ala Ser Met Asp Ala Val Cys Thr Ser Thr Ser Pro Thr Arg Ser  
 195 200 205

Met Ala Pro Gly Ala Val His Leu Pro Gln Pro Val Ser Thr Arg Ser  
 210 215 220

Gln His Thr Gln Pro Thr Pro Glu Pro Ser Thr Ala Pro Ser Thr Ser  
 225 230 235 240

Phe Leu Leu Pro Met Gly Pro Ser Pro Pro Ala Glu Gly Ser Thr Gly  
 245 250 255

Asp Phe Ala Leu Pro Val Gly Leu Ile Val Gly Val Thr Ala Leu Gly  
 260 265 270

Leu Leu Ile Ile Gly Val Val Asn Cys Val Ile Met Thr Gln Val Lys  
 275 280 285

Lys Lys Pro Leu Cys Leu Gln Arg Glu Ala Lys Val Pro His Leu Pro  
 290 295 300

Ala Asp Lys Ala Arg Gly Thr Gln Gly Pro Glu Gln Gln His Leu Leu  
 305 310 315 320

Ile Thr Ala Pro Ser Ser Ser Ser Ser Ser Leu Glu Ser Ser Ala Ser  
 325 330 335

Ala Leu Asp Arg Arg Ala Pro Thr Arg Asn Gln Pro Gln Ala Pro Gly  
 340 345 350

Val Glu Ala Ser Gly Ala Gly Glu Ala Arg Ala Ser Thr Gly Ser Ser  
 355 360 365

Asp Ser Ser Pro Gly Gly His Gly Thr Gln Val Asn Val Thr Cys Ile  
 370 375 380

Val Asn Val Cys Ser Ser Ser Asp His Ser Ser Gln Cys Ser Ser Gln  
 385 390 395 400

Ala Ser Ser Thr Met Gly Asp Thr Asp Ser Ser Pro Ser Glu Ser Pro  
 405 410 415

Lys Asp Glu Gln Val Pro Phe Ser Lys Glu Glu Cys Ala Phe Arg Ser  
 420 425 430

Gln Leu Glu Thr Pro Glu Thr Leu Leu Gly Ser Thr Glu Glu Lys Pro  
 435 440 445

Leu Pro Leu Gly Val Pro Asp Ala Gly Met Lys Pro Ser  
 450 455 460

<210> 33  
 <211> 1475  
 <212> DNA  
 <213> Homo sapiens

<400> 33  
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 agcgcgccga cctcgccacc atgagagccc tgctggcgcg cctgcttctc tgcgtcctgg 120  
 tcgtgagcga ctocaaaggc agcaatgaac ttcattcaagt tccatcgaac tgtgactgtc 180  
 taaatggagg aacatgtgtg tccaacaagt acttctccaa cattcactgg tgcaactgcc 240  
 caaagaaatt cggagggcag cactgtgaaa tagataagtc aaaaacctgc tatgagggga 300  
 atggtcactt ttaccgagga aaggccagca ctgacaccat gggccggccc tgccctgccct 360  
 ggaactctgc cactgtcctt cagcaaactg accatgccca cagatctgat gctcttcagc 420  
 tgggcctggg gaaacataat tactgcagga acccagacaa ccggaggcga ccctgggtgct 480  
 atgtgcaggt gggcctaaag ccgcttgtcc aagagtgcac ggtgcatgac tgcgcagatg 540  
 gaaaaaagcc ctctctctct ccagaagaat taaaatttca gtgtggccaa aagactctga 600  
 ggccccgctt taagattatt gggggagaat tcaccaccat cgagaaccag ccctgggttg 660  
 cggccatcta caggaggcac cgggggggct ctgtcaccta cgtgtgtgga ggcagcctca 720

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tcagcccttg ctgggtgatc agcgccacac actgcttcat tgattacca aagaaggagg      780
actacatcgt ctacctgggt cgctcaaggc ttaactccaa cacgcaaggg gagatgaagt      840
ttgaggtgga aaacctcatc ctacacaagg actacagcgc tgacacgctt gctcaccaca      900
acgacattgc cttgctgaag atccgttcca aggagggcag gtgtgcgag ccatcccga      960
ctatacagac catctgcctg cctcgatgt ataacgatcc ccagtttggc acaagctgtg     1020
agatcactgg ctttggaaaa gagaattcta ccgactatct ctatccggag cagctgaaga     1080
tgactgttgt gaagctgatt tcccaccggg agtgtcagca gcccactac tacggctctg     1140
aagtcaccac caaaatgctg tgtgctgctg acccacagtg gaaaacagat tcctgccagg     1200
gagactcagg gggaccctc gtctgttccc tccaaggcgc catgactttg actggaattg     1260
tgagctgggg ccgtggatgt gccctgaagg acaagccagg cgtctacacg agagtctcac     1320
acttcttacc ctggatccgc agtcacacca aggaagagaa tggcctggcc ctctgagggg     1380
ccccagggag gaaacgggca ccaccgctt tcttgctggt tgtcattttt gcagtagagt     1440
catctccatc agctgtaaga agagactggg aagat                                  1475

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<210> 34  
 <211> 431  
 <212> PRT  
 <213> Homo sapiens

<400> 34

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Met Arg Ala Leu Leu Ala Arg Leu Leu Leu Cys Val Leu Val Val Ser
1           5           10           15

```

```

Asp Ser Lys Gly Ser Asn Glu Leu His Gln Val Pro Ser Asn Cys Asp
           20           25           30

```

```

Cys Leu Asn Gly Gly Thr Cys Val Ser Asn Lys Tyr Phe Ser Asn Ile
           35           40           45

```

```

His Trp Cys Asn Cys Pro Lys Lys Phe Gly Gly Gln His Cys Glu Ile
           50           55           60

```

```

Asp Lys Ser Lys Thr Cys Tyr Glu Gly Asn Gly His Phe Tyr Arg Gly
65           70           75           80

```

```

Lys Ala Ser Thr Asp Thr Met Gly Arg Pro Cys Leu Pro Trp Asn Ser
           85           90           95

```

Ala Thr Val Leu Gln Gln Thr Tyr His Ala His Arg Ser Asp Ala Leu  
 100 105 110

Gln Leu Gly Leu Gly Lys His Asn Tyr Cys Arg Asn Pro Asp Asn Arg  
 115 120 125

Arg Arg Pro Trp Cys Tyr Val Gln Val Gly Leu Lys Pro Leu Val Gln  
 130 135 140

Glu Cys Met Val His Asp Cys Ala Asp Gly Lys Lys Pro Ser Ser Pro  
 145 150 155 160

Pro Glu Glu Leu Lys Phe Gln Cys Gly Gln Lys Thr Leu Arg Pro Arg  
 165 170 175

Phe Lys Ile Ile Gly Gly Glu Phe Thr Thr Ile Glu Asn Gln Pro Trp  
 180 185 190

Phe Ala Ala Ile Tyr Arg Arg His Arg Gly Gly Ser Val Thr Tyr Val  
 195 200 205

Cys Gly Gly Ser Leu Ile Ser Pro Cys Trp Val Ile Ser Ala Thr His  
 210 215 220

Cys Phe Ile Asp Tyr Pro Lys Lys Glu Asp Tyr Ile Val Tyr Leu Gly  
 225 230 235 240

Arg Ser Arg Leu Asn Ser Asn Thr Gln Gly Glu Met Lys Phe Glu Val  
 245 250 255

Glu Asn Leu Ile Leu His Lys Asp Tyr Ser Ala Asp Thr Leu Ala His  
 260 265 270

His Asn Asp Ile Ala Leu Leu Lys Ile Arg Ser Lys Glu Gly Arg Cys  
 275 280 285

Ala Gln Pro Ser Arg Thr Ile Gln Thr Ile Cys Leu Pro Ser Met Tyr  
 290 295 300

Asn Asp Pro Gln Phe Gly Thr Ser Cys Glu Ile Thr Gly Phe Gly Lys  
 305 310 315 320



85

90

95

Thr Phe Gly Gln Gly Thr Lys Val Glu Ile Lys  
                   100                  105

<210> 36  
 <211> 120  
 <212> PRT  
 <213> Mus musculus

<400> 36

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly  
 1                  5                  10                  15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asn Ile Lys Asp Thr  
                   20                  25                  30

Tyr Ile His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
                   35                  40                  45

Ala Arg Ile Tyr Pro Thr Asn Gly Tyr Thr Arg Tyr Ala Asp Ser Val  
                   50                  55                  60

Lys Gly Arg Phe Thr Ile Ser Ala Asp Thr Ser Lys Asn Thr Ala Tyr  
 65                  70                  75                  80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys  
                   85                  90                  95

Ser Arg Trp Gly Gly Asp Gly Phe Tyr Ala Met Asp Tyr Trp Gly Gln  
                   100                  105                  110

Gly Thr Leu Val Thr Val Ser Ser  
                   115                  120

<210> 37  
 <211> 120  
 <212> PRT  
 <213> Mus musculus

<400> 37

Gln Val Thr Leu Arg Glu Ser Gly Pro Ala Leu Val Lys Pro Thr Gln  
 1                  5                  10                  15

Thr Leu Thr Leu Thr Cys Thr Phe Ser Gly Phe Ser Leu Ser Thr Ser  
                   20                  25                  30

Gly Met Ser Val Gly Trp Ile Arg Gln Pro Ser Gly Lys Ala Leu Glu  
           35                  40                  45

Trp Leu Ala Asp Ile Trp Trp Asp Asp Lys Lys Asp Tyr Asn Pro Ser  
       50                  55                  60

Leu Lys Ser Arg Leu Thr Ile Ser Lys Asp Thr Ser Lys Asn Gln Val  
       65                  70                  75                  80

Val Leu Lys Val Thr Asn Met Asp Pro Ala Asp Thr Ala Thr Tyr Tyr  
                   85                  90                  95

Cys Ala Arg Ser Met Ile Thr Asn Trp Tyr Phe Asp Val Trp Gly Ala  
                   100                  105                  110

Gly Thr Thr Val Thr Val Ser Ser  
           115                  120

<210> 38  
 <211> 106  
 <212> PRT  
 <213> Mus musculus

<400> 38

Asp Ile Gln Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly  
   1                  5                  10                  15

Asp Arg Val Thr Ile Thr Cys Lys Cys Gln Leu Ser Val Gly Tyr Met  
           20                  25                  30

His Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Trp Ile Tyr  
           35                  40                  45

Asp Thr Ser Lys Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser  
       50                  55                  60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Asp  
       65                  70                  75                  80

Asp Phe Ala Thr Tyr Tyr Cys Phe Gln Gly Ser Gly Tyr Pro Phe Thr  
           85                  90                  95

Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
 100 105

<210> 39  
 <211> 1039  
 <212> DNA  
 <213> Homo sapiens

<400> 39  
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 cattctcgtc atctctgagg acatcaccat catctcagga tgaggggcat gaagctgctg 180  
 ggggcgctgc tggcactggc ggcctactg cagggggcgcg tgtccctgaa gatcgcagcc 240  
 ttcaacatcc agacatttgg ggagaccaag atgtccaatg ccaccctcgt cagctacatt 300  
 gtgcagatcc tgagccgcta tgacatgcc ctgggtccagg aggtcagaga cagccacctg 360  
 actgccgtgg ggaagctgct ggacaacctc aatcaggatg caccagacac ctatcactac 420  
 gtgggtcagtg agccactggg acggaacagc tataaggagc gctacctgtt cgtgtacagg 480  
 cctgaccagg tgtctgcggt ggacagctac tactacgatg atggctgcga gccctgcggg 540  
 aacgacacct tcaaccgaga gccagccatt gtcaggttct tctcccgggt cacagaggtc 600  
 agggagtttg ccattgttcc cctgcatgcg gccccggggg acgcagtagc cgagatcgac 660  
 gctctctatg acgtctacct ggatgtccaa gagaaatggg gcttggagga cgtcatgttg 720  
 atgggcgact tcaatgcggg ctgcagctat gtgagacctt cccagtggtc atccatccgc 780  
 ctgtggacaa gcccacctt ccagtggctg atccccgaca gcgctgacac cacagctaca 840  
 cccacgcact gtgcctatga caggatcgtg gttgcaggga tgctgctccg aggcgccgtt 900  
 gttcccgact cggctcttcc ctttaacttc caggctgcct atggcctgag tgaccaactg 960  
 gcccaagcca tcagtacca ctatccagtg gaggtgatgc tgaagtgagc agcccctccc 1020  
 cacaccagtt gaactgcag 1039

<210> 40  
 <211> 282  
 <212> PRT  
 <213> Homo sapiens

<400> 40

Met Arg Gly Met Lys Leu Leu Gly Ala Leu Leu Ala Leu Ala Ala Leu



1	5	10	15
Leu Gln Gly Ala Val Ser Leu Lys Ile Ala Ala Phe Asn Ile Gln Thr	20	25	30
Phe Gly Glu Thr Lys Met Ser Asn Ala Thr Leu Val Ser Tyr Ile Val	35	40	45
Gln Ile Leu Ser Arg Tyr Asp Ile Ala Leu Val Gln Glu Val Arg Asp	50	55	60
Ser His Leu Thr Ala Val Gly Lys Leu Leu Asp Asn Leu Asn Gln Asp	65	70	75
Ala Pro Asp Thr Tyr His Tyr Val Val Ser Glu Pro Leu Gly Arg Asn	85	90	95
Ser Tyr Lys Glu Arg Tyr Leu Phe Val Tyr Arg Pro Asp Gln Val Ser	100	105	110
Ala Val Asp Ser Tyr Tyr Tyr Asp Asp Gly Cys Glu Pro Cys Gly Asn	115	120	125
Asp Thr Phe Asn Arg Glu Pro Ala Ile Val Arg Phe Phe Ser Arg Phe	130	135	140
Thr Glu Val Arg Glu Phe Ala Ile Val Pro Leu His Ala Ala Pro Gly	145	150	155
Asp Ala Val Ala Glu Ile Asp Ala Leu Tyr Asp Val Tyr Leu Asp Val	165	170	175
Gln Glu Lys Trp Gly Leu Glu Asp Val Met Leu Met Gly Asp Phe Asn	180	185	190
Ala Gly Cys Ser Tyr Val Arg Pro Ser Gln Trp Ser Ser Ile Arg Leu	195	200	205
Trp Thr Ser Pro Thr Phe Gln Trp Leu Ile Pro Asp Ser Ala Asp Thr	210	215	220
Thr Ala Thr Pro Thr His Cys Ala Tyr Asp Arg Ile Val Val Ala Gly	225	230	235
			240

Met Leu Leu Arg Gly Ala Val Val Pro Asp Ser Ala Leu Pro Phe Asn  
 245 250 255

Phe Gln Ala Ala Tyr Gly Leu Ser Asp Gln Leu Ala Gln Ala Ile Ser  
 260 265 270

Asp His Tyr Pro Val Glu Val Met Leu Lys  
 275 280

<210> 41  
 <211> 678  
 <212> DNA  
 <213> Mus musculus

<400> 41  
 gacatcttgc tgactcagtc tccagccatc ctgtctgtga gtccaggaga aagagtcagt 60  
 ttctcctgca gggccagtc gttcgttggc tcaagcatcc actggtatca gcaaagaaca 120  
 aatggttctc caaggcttct cataaagtat gcttctgagt ctatgtctgg gatcccttcc 180  
 aggttttagtg gcagtggatc agggacagat tttactctta gcatcaaacac tgtggagtct 240  
 gaagatattg cagattatta ctgtcaacaa agtcatagct ggccattcac gttcggctcg 300  
 gggacaaatt tggaagtaaa agaagtgaag cttgaggagt ctggaggagg cttggtgcaa 360  
 cctggaggat ccatgaaact ctctgtgtt gcctctggat tcattttcag taaccactgg 420  
 atgaactggg tccgccagtc tccagagaag gggcttgagt gggttgctga aattagatca 480  
 aaatctatta attctgcaac acattatgog gagtctgtga aaggagggtt caccatctca 540  
 agagatgatt ccaaaagtgc tgtctacctg caaatgaccg acttaagaac tgaagacact 600  
 ggcgtttatt actgttccag gaattactac ggtagtacct acgactactg gggccaaggg 660  
 accactctca cagtctcc 678

<210> 42  
 <211> 226  
 <212> PRT  
 <213> Mus musculus

<400> 42

Asp Ile Leu Leu Thr Gln Ser Pro Ala Ile Leu Ser Val Ser Pro Gly  
 1 5 10 15

Glu Arg Val Ser Phe Ser Cys Arg Ala Ser Gln Phe Val Gly Ser Ser

20	25	30
Ile His Trp Tyr Gln Gln Arg Thr Asn Gly Ser Pro Arg Leu Leu Ile 35 40 45		
Lys Tyr Ala Ser Glu Ser Met Ser Gly Ile Pro Ser Arg Phe Ser Gly 50 55 60		
Ser Gly Ser Gly Thr Asp Phe Thr Leu Ser Ile Asn Thr Val Glu Ser 65 70 75 80		
Glu Asp Ile Ala Asp Tyr Tyr Cys Gln Gln Ser His Ser Trp Pro Phe 85 90 95		
Thr Phe Gly Ser Gly Thr Asn Leu Glu Val Lys Glu Val Lys Leu Glu 100 105 110		
Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly Ser Met Lys Leu Ser 115 120 125		
Cys Val Ala Ser Gly Phe Ile Phe Ser Asn His Trp Met Asn Trp Val 130 135 140		
Arg Gln Ser Pro Glu Lys Gly Leu Glu Trp Val Ala Glu Ile Arg Ser 145 150 155 160		
Lys Ser Ile Asn Ser Ala Thr His Tyr Ala Glu Ser Val Lys Gly Arg 165 170 175		
Phe Thr Ile Ser Arg Asp Asp Ser Lys Ser Ala Val Tyr Leu Gln Met 180 185 190		
Thr Asp Leu Arg Thr Glu Asp Thr Gly Val Tyr Tyr Cys Ser Arg Asn 195 200 205		
Tyr Tyr Gly Ser Thr Tyr Asp Tyr Trp Gly Gln Gly Thr Thr Leu Thr 210 215 220		
Val Ser 225		
<210> 43		
<211> 450		

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;400&gt; 43

```

gctgcatcag aagaggccat caagcacatc actgtccttc tgccatggcc ctgtggatgc      60
gcctcctgcc cctgctggcg ctgctggccc tctggggacc tgaccagcc gcagcctttg      120
tgaaccaaca cctgtgcggc tcacacctgg tggaagctct ctacctagtg tgcggggaac      180
gaggcttctt ctacacaccc aagacccgcc gggaggcaga ggacctgcag gtggggcagg      240
tggagctggg cggggggccct ggtgcaggca gcctgcagcc cttggccctg gaggggtccc      300
tgcagaagcg tggcattgtg gaacaatgct gtaccagcat ctgctccctc taccagctgg      360
agaactactg caactagacg cagcccgagc gcagccccc acccgccgcc tctgcaccg      420
agagagatgg aataaagccc ttgaaccagc      450

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&lt;210&gt; 44

&lt;211&gt; 110

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 44

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Met Ala Leu Trp Met Arg Leu Leu Pro Leu Leu Ala Leu Leu Ala Leu
1           5           10           15

Trp Gly Pro Asp Pro Ala Ala Ala Phe Val Asn Gln His Leu Cys Gly
          20           25           30

Ser His Leu Val Glu Ala Leu Tyr Leu Val Cys Gly Glu Arg Gly Phe
          35           40           45

Phe Tyr Thr Pro Lys Thr Arg Arg Glu Ala Glu Asp Leu Gln Val Gly
          50           55           60

Gln Val Glu Leu Gly Gly Gly Pro Gly Ala Gly Ser Leu Gln Pro Leu
65           70           75           80

Ala Leu Glu Gly Ser Leu Gln Lys Arg Gly Ile Val Glu Gln Cys Cys
          85           90           95

Thr Ser Ile Cys Ser Leu Tyr Gln Leu Glu Asn Tyr Cys Asn
          100          105          110

```

&lt;210&gt; 45

<211> 1203  
 <212> DNA  
 <213> Hepatitis B virus

<400> 45  
 atgggagggtt ggtcttccaa acctcgacaa ggcattgggga cgaatctttc tgttcccaat 60  
 cctctgggat tctttccga tcaccagttg gacctgcgt tcggagccaa ctcaaacaat 120  
 ccagattggg acttcaaccc caacaaggat cactggccag aggcaatcaa ggtaggagcg 180  
 ggagacttcg ggccagggtt caccacacca caggcggtc ttttggggtg gagccctcag 240  
 gctcagggca tattgacaac agtgccagca ggcctcctc ctgtttccac caatcggcag 300  
 tcaggaagac agcctactcc catctctcca cctctaagag acagtcatcc tcaggccatg 360  
 cagtggaaact ccacaacatt ccaccaagct ctgctagatc ccagagttag ggcctatat 420  
 tttcctgctg gtggctccag ttccggaaca gtaaacctg ttccgactac tgtctcacco 480  
 atatogtcaa tcttctcgag gactggggac cctgcaccga acatggagag cacaacatca 540  
 ggattcctag gacctctgct cgtgttacag gcggggtttt tcttggtgac aagaatcctc 600  
 acaataccac agagtctaga ctctgggtg acttctctca attttctagg gggagcacco 660  
 acgtgtcctg gccaaaattc gcagtcacca acctccaatc actcaccaac ctcttgtcct 720  
 ccaatttgct ctgggtatcg ctggatgtgt ctgcggcggt ttatcatatt cctcttcac 780  
 ctgctgctat gcctcatctt cttgttggtt cttctggact accaagggtat gttgcccggt 840  
 tgtcctctac ttccaggaac atcaactacc agcacgggac catgcaagac ctgcacgatt 900  
 cctgctcaag gaacctctat gtttccctct tggtgctgta caaaaccttc ggacggaaac 960  
 tgcacttgta ttcccatccc atcatcctgg gctttcgcaa gattcctatg ggagtgggcc 1020  
 tcagtccgtt tctcctgggt cagtttacta gtgccatttg ttcagtgggt cgcagggtt 1080  
 tccccactg tttggctttc agttatatgg atgatgtggt attgggggcc aagtctgtac 1140  
 aacatcttga gtcccttttt acctctatta ccaattttct tttgtctttg ggtatacatt 1200  
 tga 1203

<210> 46  
 <211> 400  
 <212> PRT  
 <213> Hepatitis B virus

<400> 46

Met Gly Gly Trp Ser Ser Lys Pro Arg Gln Gly Met Gly Thr Asn Leu  
 1 5 10 15

Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro  
 20 25 30

Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Asn  
 35 40 45

Lys Asp His Trp Pro Glu Ala Ile Lys Val Gly Ala Gly Asp Phe Gly  
 50 55 60

Pro Gly Phe Thr Pro Pro His Gly Gly Leu Leu Gly Trp Ser Pro Gln  
 65 70 75 80

Ala Gln Gly Ile Leu Thr Thr Val Pro Ala Ala Pro Pro Pro Val Ser  
 85 90 95

Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu  
 100 105 110

Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Thr Phe His  
 115 120 125

Gln Ala Leu Leu Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly  
 130 135 140

Gly Ser Ser Ser Gly Thr Val Asn Pro Val Pro Thr Thr Val Ser Pro  
 145 150 155 160

Ile Ser Ser Ile Phe Ser Arg Thr Gly Asp Pro Ala Pro Asn Met Glu  
 165 170 175

Ser Thr Thr Ser Gly Phe Leu Gly Pro Leu Leu Val Leu Gln Ala Gly  
 180 185 190

Phe Phe Leu Leu Thr Arg Ile Leu Thr Ile Pro Gln Ser Leu Asp Ser  
 195 200 205

Trp Trp Thr Ser Leu Asn Phe Leu Gly Gly Ala Pro Thr Cys Pro Gly  
 210 215 220

Gln Asn Ser Gln Ser Pro Thr Ser Asn His Ser Pro Thr Ser Cys Pro  
 225 230 235 240

Pro Ile Cys Pro Gly Tyr Arg Trp Met Cys Leu Arg Arg Phe Ile Ile  
 245 250 255

Phe Leu Phe Ile Leu Leu Leu Cys Leu Ile Phe Leu Leu Val Leu Leu  
 260 265 270

Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu Leu Pro Gly Thr Ser  
 275 280 285

Thr Thr Ser Thr Gly Pro Cys Lys Thr Cys Thr Ile Pro Ala Gln Gly  
 290 295 300

Thr Ser Met Phe Pro Ser Cys Cys Cys Thr Lys Pro Ser Asp Gly Asn  
 305 310 315 320

Cys Thr Cys Ile Pro Ile Pro Ser Ser Trp Ala Phe Ala Arg Phe Leu  
 325 330 335

Trp Glu Trp Ala Ser Val Arg Phe Ser Trp Leu Ser Leu Leu Val Pro  
 340 345 350

Phe Val Gln Trp Phe Ala Gly Leu Ser Pro Thr Val Trp Leu Ser Val  
 355 360 365

Ile Trp Met Met Trp Tyr Trp Gly Pro Ser Leu Tyr Asn Ile Leu Ser  
 370 375 380

Pro Phe Leu Pro Leu Leu Pro Ile Phe Phe Cys Leu Trp Val Tyr Ile  
 385 390 395 400

<210> 47

<211> 799

<212> DNA

<213> Homo sapiens

<400> 47

cgaaccactc agggctctgt ggacagctca cctagctgca atggctacag gctcccgga 60

gtccctgctc ctggcttttg gctgctctg cctgccctgg cttcaagagg gcagtgcctt 120

cccaaccatt cccttatcca ggccttttga caacgctatg ctccgcgccc atcgtctgca 180

ccagctggcc tttgacacct accaggagtt tgaagaagcc tatatcccaa aggaacagaa 240

gtattcattc ctgcagaacc ccagacctc cctctgtttc tcagagtcta ttccgacacc 300

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ctccaacagg gaggaaacac aacagaaatc caacctagag ctgctccgca tctccctgct 360
ggtcatccag tcgtggctgg agcccgtgca gttcctcagg agtgtcttcg ccaacagcct 420
gggtgtacggc gcctctgaca gcaacgtcta tgacctccta aaggacctag aggaaggcat 480
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gacctacagc aagttcgaca caaactcaca caacgatgac gcactactca agaactacgg 600
gctgctctac tgcttcagga aggacatgga caaggctcag acattcctgc gcacgtgca 660
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ctccccagtg cctctcctgg ccctggaagt tgccactcca gtgccaccca gccttgctct 780
aataaaatta agttgcatc 799

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<210> 48
<211> 217
<212> PRT
<213> Homo sapiens

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<400> 48

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Met Ala Thr Gly Ser Arg Thr Ser Leu Leu Leu Ala Phe Gly Leu Leu
1           5           10           15

```

```

Cys Leu Pro Trp Leu Gln Glu Gly Ser Ala Phe Pro Thr Ile Pro Leu
          20           25           30

```

```

Ser Arg Pro Phe Asp Asn Ala Met Leu Arg Ala His Arg Leu His Gln
          35           40           45

```

```

Leu Ala Phe Asp Thr Tyr Gln Glu Phe Glu Glu Ala Tyr Ile Pro Lys
          50           55           60

```

```

Glu Gln Lys Tyr Ser Phe Leu Gln Asn Pro Gln Thr Ser Leu Cys Phe
          65           70           75           80

```

```

Ser Glu Ser Ile Pro Thr Pro Ser Asn Arg Glu Glu Thr Gln Gln Lys
          85           90           95

```

```

Ser Asn Leu Glu Leu Leu Arg Ile Ser Leu Leu Leu Ile Gln Ser Trp
          100          105          110

```

```

Leu Glu Pro Val Gln Phe Leu Arg Ser Val Phe Ala Asn Ser Leu Val
          115          120          125

```



Tyr Gly Ala Ser Asp Ser Asn Val Tyr Asp Leu Leu Lys Asp Leu Glu  
 130 135 140

Glu Gly Ile Gln Thr Leu Met Gly Arg Leu Glu Asp Gly Ser Pro Arg  
 145 150 155 160

Thr Gly Gln Ile Phe Lys Gln Thr Tyr Ser Lys Phe Asp Thr Asn Ser  
 165 170 175

His Asn Asp Asp Ala Leu Leu Lys Asn Tyr Gly Leu Leu Tyr Cys Phe  
 180 185 190

Arg Lys Asp Met Asp Lys Val Glu Thr Phe Leu Arg Ile Val Gln Cys  
 195 200 205

Arg Ser Val Glu Gly Ser Cys Gly Phe  
 210 215

<210> 49  
 <211> 963  
 <212> DNA  
 <213> Homo sapiens

<400> 49  
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 gtcccgccg agtgcttoga cctgctgggc cggcactgag tggcctgagg gctcctgagg 180  
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 aaggacaccc tcatgatctc ccggaccctt gaggtcacat gcgtgggtgt ggacgtgagc 420  
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 aagacaaagc cgcgggagga gcagtacaac agcacgtacc gtgtgggtcag cgtcctcacc 540  
 gtcctgcacc aggactgggt gaatggcaag gactacaagt gcaaggtctc caacaaagcc 600  
 ctcccagccc ccatcgagaa aaccatctcc aaagccaaag ggcagccccg agaaccacag 660  
 gtgtacaccc tgccccatc ccgggatgag ctgaccaaga accagggtcag cctgaacctgc 720  
 ctgggtcaaag gcttctatcc cagcgacatc gccgtggagt gggagagcaa tgggcagccg 780

gagaacaact acaagaccac gcctcccggtg ttggactccg acggctcctt cttcctctac 840  
 agcaagctca ccgtggacaa gagcaggtgg cagcagggga acgtcttctc atgctccgtg 900  
 atgcatgagg ctctgcacaa ccactacacg cagaagagcc tctccctgtc tcccgggaaa 960  
 tga 963

<210> 50  
 <211> 320  
 <212> PRT  
 <213> Homo sapiens

<400> 50

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
 1 5 10 15

Gly Ser Thr Gly Asp Val Arg Arg Gly Pro Arg Ser Leu Arg Gly Arg  
 20 25 30

Asp Ala Pro Ala Pro Thr Pro Cys Val Pro Ala Glu Cys Phe Asp Leu  
 35 40 45

Leu Val Arg His Cys Val Ala Cys Gly Leu Leu Arg Thr Pro Arg Pro  
 50 55 60

Lys Pro Ala Gly Ala Ser Ser Pro Ala Pro Arg Thr Ala Leu Gln Pro  
 65 70 75 80

Gln Glu Ser Val Gly Ala Gly Ala Gly Glu Ala Ala Val Asp Lys Thr  
 85 90 95

His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser  
 100 105 110

Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg  
 115 120 125

Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro  
 130 135 140

Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala  
 145 150 155 160

Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val

165 170 175

Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr  
180 185 190

Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr  
195 200 205

Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu  
210 215 220

Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys  
225 230 235 240

Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser  
245 250 255

Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp  
260 265 270

Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser  
275 280 285

Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala  
290 295 300

Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys  
305 310 315 320

<210> 51  
<211> 107  
<212> PRT  
<213> Homo sapiens

<400> 51

Asp Ile Gln Met Thr Gln Thr Pro Ser Thr Leu Ser Ala Ser Val Gly  
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr  
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
35 40 45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro  
 65 70 75 80

Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp  
 85 90 95

Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys  
 100 105

<210> 52  
 <211> 107  
 <212> PRT  
 <213> Mus musculus

<400> 52

Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly  
 1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Asn Asn Tyr  
 20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Ile Val Lys Leu Leu Ile  
 35 40 45

Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
 50 55 60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln  
 65 70 75 80

Glu Asp Ile Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp  
 85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys  
 100 105

<210> 53  
 <211> 119  
 <212> PRT  
 <213> Homo sapiens

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Leu Ile Glu Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Ile  
 35 40 45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
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Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr  
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Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys  
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Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly  
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Thr Leu Val Thr Val Ser Ser  
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&lt;210&gt; 54

&lt;211&gt; 119

&lt;212&gt; PRT

&lt;213&gt; Mus musculus

&lt;400&gt; 54

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 35 40 45

Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
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Lys Gly Lys Ala Thr Leu Thr Val Asp Lys Ser Ser Thr Thr Ala Tyr  
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Met Gln Leu Ser Ser Leu Thr Ser Asp Asp Ser Ala Val Tyr Phe Cys  
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Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Arg Gly  
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Thr Leu Val Thr Val Ser Ala  
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Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile  
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Tyr Tyr Thr Ser Thr Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly  
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Thr Leu Thr Ile Ser Ser Leu Gln Pro  
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Asp Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp  
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Thr Phe Gly Gln Gly Thr Lys Val Glu Val Lys Arg Thr Val Ala Ala  
100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly  
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Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala  
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Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln  
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Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser  
 165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr  
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Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser  
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Phe Asn Arg Gly Glu Cys  
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Gly Val Ile Tyr Pro Gly Ser Gly Gly Thr Asn Tyr Asn Glu Lys Phe  
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Lys Gly Arg Val Thr Leu Thr Val Asp Glu Ser Thr Asn Thr Ala Tyr  
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Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Phe Cys  
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Ala Arg Arg Asp Gly Asn Tyr Gly Trp Phe Ala Tyr Trp Gly Gln Gly  
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Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe  
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Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu  
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Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp  
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Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu  
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Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser  
 180 185 190

Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro  
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Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro  
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Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp  
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Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn  
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Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val  
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Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu  
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Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys  
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Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr



340

345

350

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